The Builder.

VOL. XXXIX. No. 1966. SATURDAY, JULY 31, 1880.

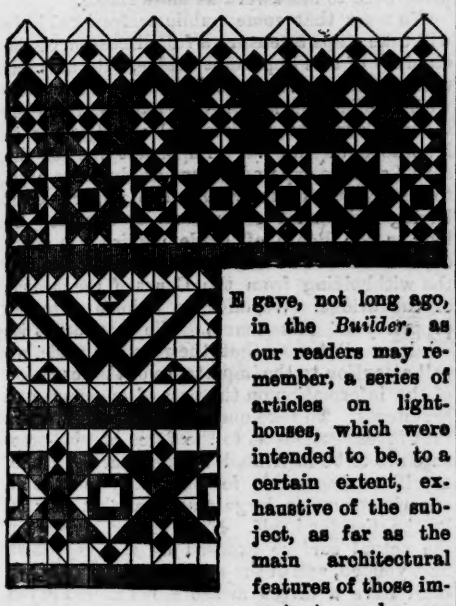
ILLUSTRATIONS.

Monument to Gerhard Kremer, called "Mercator," Duisburg on the Rhine.—Herr Reiss, Düsseldorf, Sculptor 140
Sulzfeld, Germany 142
The Fisher-Lads' Institute, Great Grimsby (with Plans)—Mr. Charles Bell, Architect 144, 145
Town-hall and Court-House, Kingstown, Co. Dublin.—Mr. John L. Robinson, Architect 147

CONTENTS.

Concrete Towers 149
Rebuilding of the Tay Bridge 150
The Manufacture of Furniture in Germany 151
Royal Academy Speculations 151
Fine Art Exhibition at Turin 152
Proposed Tunnel under Mont Blanc 152
From the Banks of the Seine 152
Mortality in Mines 153
The Coal Supply of London 153
The Sanitary Meeting at the Mansion House 154
A Foreign Archæological Work 155
Bristol and Gloucestershire Archæological Society 156
New Workshops of the London, Tilbury, and Southend Railway 157
Monument to Mercator, Duisburg 157
The Society of Engineers 158
Sulzfeld 159
Fisher Lads' Institute, Great Grimsby 159
Kingstown Town-Hall, Ireland 140
Permanent Art-Gallery and Museum for Birmingham 149
The Parkes Museum of Hygiene 150
The National Association of Master-Builders 151
Federation of Building Trade Employés 152
The New Bootle Docks 152
Rebuilding and Repair of Metropolitan Bridges: Appointment of an Assistant-Engineer 153
Cyprus 153
Sun Symbols 154
Art-Union of London 154
New Cemetery and Chapels, Everton 154
Approaching Congress of the Social Science Association 155
Sale of Building Site in Park-lane, Mayfair 155
Sale of Modern Buildings in Charterhouse-street 155
Sales of Building Land at Hendon, Finchley, Willesden, &c. 155
Business Premises 155
Curious Defence to an Action: Architect or Builder? 155
Local Boards and Owners of Property: The Tottenham Local Board of Health v. Rowell 155
Is a Road a Street?—Mayor of Accrington v. Nutter 156
Lambeth Palace Library: New Regulations 156
Architect and Contractor 156
Payment for Quantities by Builders 156
History of Stained Glass 156
Stained Glass 156
Drinking-Fountains 156
Builders' Benevolent Institution 157
Excursion by the Architectural Association 157
Pitch-Pine 157
Brick-making 157
Church Building News 157
Various 157
Miscellanea 158

Concrete Towers.



It gave, not long ago, in the *Builder*, as our readers may remember, a series of articles on lighthouses, which were intended to be, to a certain extent, exhaustive of the subject, as far as the main architectural features of those important works are concerned. In connexion with those papers and a more general purpose beyond, it may be useful to draw attention to a communication addressed to the Institution of Civil Engineers, by Mr. Imrie Bell, C.E.

It will, no doubt, be in the memory of our readers that we gave reason for the proposition that, for sea-girt towers, the practice and the experimental reasoning of Mr. Stevenson and other engineers had led to the establishment of the rules,* that the outline of any such tower should be defined by a hyperbolic curve; and that the material for construction should be not only the largest, but also the specifically heaviest stones that could be practically obtained by the architect. To these two rules we refer, without any qualification, as far as the species of tower to which we confined them is concerned. In the case of a tower built on a promontory high above the dash of the waves, the same conditions do not exist, and therefore the same rules do not necessarily apply. We illustrated the classification of lighthouses by contrasting the very different experience obtained in the construction of the Morant Point Lighthouse, in Jamaica, by the late Mr. Alexander Gordon, and in the unsuccessful attempt to apply the same method of construction that was there found available in the very different situation of the Great Basses Rock, near Ceylon.

The experience of Mr. Imrie Bell is in full accordance with the rules that we ventured to indicate as absolutely to be accepted by the lighthouse builder. In the Morant Point lighthouse we described an edifice of which the base was formed of concrete protected by a shell of cast iron. We have now to look at the account of a tower which, standing at an elevation of 100 ft. above the sea, was constructed of concrete alone. And what strikes us as probably the most admirable part of the whole design is that the concrete was so disposed as to have, like an organised being, a proper skin of its own. The value of this simple but novel arrangement is the more worthy of remark inasmuch as it is not confined to the construction of lighthouses, but is likely to be adopted, with the best results, by the builders of houses and other structures.

Mr. Bell commences by remarking on the use of concrete by the Romans, on its gradual disuse, on its re-introduction as a foundation, and on the introduction of *béton*, or hydraulic concrete, by the French engineers, followed by our own (among whom the late Mr. John Hughes may be cited as one of the earliest to introduce the French practice). He then refers to the valuable and exhaustive researches of Vicat, and to the improvements made in the manufacture of cements. It would be desirable here to introduce a short account of the use of concrete in England by the house-builder. For this, however, we are as yet without full materials; although, having been for a short time resident in a house built, in a very exposed situation, of concrete, we are able to speak of one unexpected excellence which it possessed in common with others more generally known,—that is, the great quiet and silence which prevail in it in a high wind. Before rising in the morning, no idea was obtained that a gale was on. The cause we take to be the absence of those joints through which the wind rushes as in confined channels, which are thus indicated as the cradle of noise.

Mr. Bell tells us that he has been much struck by the want of attention paid to the art of producing a fair and finished surface in the exposed faces of concrete, as exemplified in many of the large engineering works in the course of construction, where the exposed face has a honeycombed appearance, as well as showing the marks of the rough timber planks forming the frames in which the concrete had been placed. In this remark of an engineer every architect will agree. Nor is it a question of appearance only. These unsightly hollows and projections retain damp, and offer needless resistance to wind, thus at the same time hastening the ultimate decay of the artificial mass, as well as destroying that quiet to which we before referred.

The result of the study given to this part of the subject by Mr. Bell is, that this objectionable aspect of a concrete building arises simply from neglect or indifference. It is possible, nay, even easy, with due attention, not only to produce a fair surface, but to form mouldings, and even tracery and ornament, and at the same time to make the face-work as durable as any other part of the block. It is evident that this is a view of the case which, if worked out, is likely to result in the very general introduction of concrete as a material for house-building. It is to be regretted, with reference to this, that although Mr. Bell has given the cost of the lighthouse of which we have to speak, in block, he has not given the price per cubic yard of the concrete, applied after his method.

When it has been attempted hitherto to give a face to a concrete structure, it has usually been done either by rendering with plaster, or by grouting with liquid mortar, both of which are more than questionable modes of effecting the object. The best result that can thus be attained is that of a veneer, liable to sudden decay, and particularly liable to destruction by frost. Failure is said to have so often occurred as to prevent recurrence to this imperfect and unworkmanlike finish; so that the concrete surface yet remains in generally its natural roughness.

The method adopted by Mr. Bell is one that, on the first blush, recommends itself to the architect. He has provided moulds, made of smooth-planed board, to act like the matrix of a seal, or the mould of a metal cast. Immediately before applying the mould, he coats it over with a mucilaginous soap, to prevent the adherence of the concrete. In filling the frame, or mould, care must be taken that a mixture of fine concrete or cement is laid in with a trowel close to the face-board, as the work proceeds, so that the mixture is carried up uniformly with the body of the work, and the whole forms one homogeneous mass. The face is thus like the skin of an iron casting; and if the mixture of materials be judicious, it will be really the strongest part of the whole structure. Mr. Bell tells us that he has followed out this process in harbour walls, both above and below water, exposed to frost, heat, storm, and rain, and that he has done so with complete success, and at an inappreciable increase of cost.

The first example, so far as we are aware, of the application of this method of construction to a lighthouse tower, is the Corbière lighthouse, in the island of Jersey. This lighthouse was erected in 1873-1874, on the design of Sir John Coode, C.E., by Mr. Imrie Bell as executive engineer. It stands upon the Corbière rock, off the south-western point of the island of Jersey, at a distance of about 1,600 ft. from the mainland. The spot might be thought to have been designed for the purpose by Nature herself, as here exists, reared above the fury of the waves, that very substantial rocky basis for the light tower, the artificial construction of which has so taxed the efforts of the lighthouse architect in less favoured localities. At high water, in all tides, La Corbière is isolated; but from shortly after half-ebb to a little before half-flood it is accessible, when the sea is smooth, over the crest of a ridge of rocks which forms a narrow causeway. The range of the tide on the coast is 23 ft. at ordinary neaps, and 32 ft. at ordinary springs, and the locality is much exposed.

The first operation commenced was the construction of a road of access, of above half a mile in length. Together with this work, dwelling-houses for the light-keepers, with necessary store-houses and outbuildings, were constructed on the main land; but there is nothing particularly worthy of notice as to this part of the scheme. The tidal causeway, however, constructed on the ledge of rocks above

* See *Builder*, vol. xxxvii. (1879), p. 767.

mentioned, required more consideration. The ledge was intersected by deep fissures and pools of water. Owing to its regular submergence the time for work was very limited, as the operations could only be proceeded with from the shore end. The cross section of the road has a top width of 6 ft., and is formed by two walls built of granite blocks, with a batter of 2 to 1, the height of which varied from 1 ft. to 8 ft. The space between these walls is filled up with Portland cement concrete, mixed in the proportion of eight parts of shingle and coarse sand to one of cement. The upper layer of 8 in. was made stronger and finer, in the proportion of four parts of shingle and sand to one of cement.

The action of the sea during gales has been enough to prevent any great accumulation of seaweed upon the surface of the causeway; and a sprinkling of hot lime in calm weather was found sufficient to prevent growth of vegetation.

The materials for the road and lighthouse were conveyed by sea from St. Helier's, and landed in an accessible and sheltered place near the site of the lighthouse. A patch of rocks formed a sort of natural wharf, from which an overhead rope railway was constructed to the site of the stores and workshops on the main rock; a wheel with grooved tire running along the rope, supporting a block and tackle for suspending the basket or bag containing the material. This wheel and tackle were pulled along the ropeway by a small endless wire rope, wound round a drum, and worked by two men at a windlass.

An inclined tramway, on a 3 ft. gauge, was laid, on longitudinal timbers, from the workshops to the site of the tower, and worked by a steam-engine. Details of all these contrivances are given by Mr. Bell; but their interest is chiefly special. What we have to regard with most attention is the method of building in concrete employed, which possesses a very general interest.

The base of the tower,—it is to be regretted that we do not find the level of the sea referred to in any of the drawings accompanying the paper,—was roughly quarried, leaving a core of about 13 ft. in diameter, and 7 ft. in height. The frame used for forming the exterior face of the concrete was a segment of one-eighth part of a circle, 3 ft. in height, dressed in face to a radius of 15 ft. 6 in., with a batter of 1 in 12. This was fixed in place by means of tie-bolts lewised into the rock. The concrete was composed of six parts of shingle and sand to one of cement. It was thrown into the segmental frame, the face being prepared as before described. The frame was removed on the third day, when a solid block of concrete was exposed, with a face equal to dressed ashlar, and a hardness about equal to that of a soft brick. A batten was fixed upright at each end of the frame, so that when the concrete hardened and the batten was removed, there was a vertical slot at each joint, about 9 in. deep by 4 in. wide; when the frame was shifted, and the next segment was filled in, the fresh concrete entered this slot, and formed a natural joggle or dovetail, holding the two blocks together. A concentric channel, 9 in. broad by 4 in. deep, was left in the top of each course for the same purpose. This was in its turn filled up by the concrete of the course above, so that the whole structure was bound together in its own substance. From the drawing it appears that there were three of these courses, the joints of which are marked by a chamfer. On the top of the third course is a recess of 4 ft., and within this the base of the tower itself is placed. This structure rises vertically for about 6 ft. 6 in., where there is a moulded soffit. From this the wall of the tower rises with a curved batter, and is topped with a heavy torus moulding. However much credit may be justly claimed for the engineering of the building, we cannot but hold that the elevation of the tower, so far as we can judge from the drawings, is not characterised by any architectural elegance. The stepped base and heavy top moulding seem to contain a not inconsiderable amount of material, the structural utility of which we fail to perceive. In the drawings attached to the paper a section of the lantern is given; but the sections and elevation of the tower show the masonry, that is to say the concrete, alone. It is thus not possible to speak with certitude as to the architectural effect of the complete building, and we may hope that the criticism provoked by the lines of the tower alone may be qualified by the addition of the lantern.

On the top of the platform, which is formed of a solid mass of concrete over the whole area, the tower was carried up in a mode very similar to that before described, with the exception that the mould frames were made to radiate from an iron centre, firmly secured in the true axis of the tower. Two blocks, forming opposite sectors, were filled in at the same time, so that each circular course was completed in four shifts.

The height of the tower and platform together is 44 ft. The well of the tower is 11 ft. diameter. The structure of the concrete circular wall diminishes from 4 ft. 3 in. at the plinth mouldings, to 2 ft. 6 in. under the cavetto at the top. The interior is divided into two chambers, although there is a landing and preparation for an intermediate floor. These floors and landings are supported on T-iron girders, built into the walls, and filled in between and above with fine cement concrete.

A hollow cast-iron column, 13 in. in diameter, and ⅝ in. thick, is built into the platform in the axis of the tower. On the top of this is secured the pedestal of the optical apparatus. For further details we refer to the paper, which will be found in vol. lix. of the Minutes of Proceedings of the Institution of Civil Engineers. The total cost of the work is given as 8,001*l.*, of which 1,606*l.* was expended on the half-tide causeway; 2,976*l.* on the structure; 2,255*l.* on the lantern and apparatus, including fog-bells and clock; and 864*l.* on dwelling-houses and store-rooms. As far as we can collect by scaling from the drawings, the total height from the lowest part of the platform wall to the top of the ball supporting the vane is 62 ft. If we take the height of the centre of the light at 50 ft. above the foundation, we find that the total cost of the whole work, excluding the causeway, comes to 128*l.* per foot vertical, or to 160*l.* per foot vertical including the causeway; a figure which may be advantageously compared with those which we have already given for the cost of this class of buildings.

The interest of the paper of Mr. Imrie Bell is far wider than that which concerns the construction of lighthouses. That he has been alone in his treatment of concrete we are not prepared to admit. But that his paper has been the first to call the attention of his own section of the structural profession to the true mode of procuring a good, durable, and workmanlike finish to a building composed of this material, we think is the case. Nor can it be denied that by this treatment the value of concrete as a building material is very considerably enhanced. We may regard the compound as an artificial stone, which possesses the quality that it is in the power of the maker to vary the composition at will, and not only to do so block by block, but to give to the exterior of the block a fine and sightly skin; while the bones of the work,—like the human skeleton,—are composed of a more rough and cheap material.

REBUILDING OF THE TAY BRIDGE.

A SELECT COMMITTEE has been appointed by the House of Commons to inquire into the Bill introduced into Parliament by the North British Railway Company for the reconstruction of the Tay Bridge. The heads of the order of reference were, first, as to the expediency of rebuilding the bridge in the original position; secondly, whether a more suitable site might be selected; third, the interests of the navigation; fourth, the security and permanent safety of the bridge, if authorised to be rebuilt. Some petitions were presented against the scheme; but they were not supported by counsel.

It was stated by Mr. Clerk, Q.C., on the part of the promoters of the Bill, that the cost of the new bridge was estimated at 346,000*l.* To provide this sum it was proposed to raise 200,000*l.* on the authority of the Bill; to borrow 66,000*l.*; and to take 80,000*l.* out of the 120,000*l.* which is the present reserve fund of the company.

As to the design, counsel stated that it was proposed to lower the height of four of the thirteen new spans by 11 ft., or from 88 ft. to 77 ft. high; and to reduce the height of the other nine spans 2 ft., from 57 ft. to 55 ft. The Lord Provost of Perth gave evidence to the effect that ample height would be thus allowed for the navigation, with which the Board of Trade concurred. The largest vessel ever known to have passed up the river above the site of the bridge was stated, by the pilot-master of Dundee, to be 600 tons. Uncontradicted evidence was adduced in support of the convenience of the actual site. Sir Massey Lopes, the chairman of the committee, suggested that it would be desirable if three or four experts, independent of the Board of Trade, were appointed to look into the matter,—an excellent suggestion that was at once agreed to by Mr. Michael, Q.C., on the part of the Board of Trade.

Mr. Brunlees was examined as to the design for the new bridge. He said that he had found the Tay bottom well adapted for the carrying of a heavy weight. He had examined the bed of the river, and thought that there was no danger to be apprehended from scour but such as it was easy to obviate by the use of stone. The plan before Parliament was presented under the authority of Mr. Brunlees. He had decided on replacing the iron work of the piers with brickwork, the cost entailed by which change was estimated at 111,725*l.* The total estimate for the design, allowing 10 per cent. for contingencies, was 356,323*l.* Mr. Brunlees found that the cost of the brick piers would be about the same as that of thoroughly making good the iron pillars now standing, and gave preference to brickwork as more stable.

We trust that some public professional body will take steps to ensure a full discussion of the stability of this important bridge, both as far as concerns the past and the future structure. Notwithstanding the lengthened inquiry which has taken place, the professional world is yet in ignorance of the very important fact of the actual surface exposed, in one of the large bays, to the action of the wind. The importance of having this point cleared up is obvious. So long as the Board of Trade inquiry was going on, the usual caution of lawyers probably caused the withholding from the Court of the designs of the bridge. We offer no opinion as to the propriety of this course. We may doubt its wisdom. But now that the report is made, we call attention to the importance of the possession of the information on the part of engineers and architects. To take one point alone, it appears that investigations as to the force of wind-pressure are to be instituted by the Board of Trade. It will be impossible for that body to make an experiment on so large a scale as that afforded by the disaster itself. If we are made aware of the actual surface exposed by the bay which first yielded, and of the strength of the piers, we shall have a direct measure, not indeed of the maximum force of the wind, but of that which was exerted at the moment of fracture. This is quite a distinct question from that of either the strength which ought to have been given to the bridge, or of the highest fury which the storm of the night in question attained. If we are made acquainted with the surface on which the wind acted, and with the strength of the piers which yielded to the stress, we shall at once obtain a measure of the wind-pressure per square foot of the surface of the girder at the moment of collapse,—a datum on the value of which it is useless to dwell.

It should also be borne in mind that the mere substitution of brick for iron in the piers is not in itself a guarantee of their stability, if the present disproportion between the height and the transverse width,—that is to say, the width at right angles to the wind-pressure,—is maintained. The case of a chimney, or lofty tower, is in no way analogous to that of a thin, tall, narrow pier, sustaining on the top a structure that will catch an enormous quantity of wind. The case of a windmill is more apt; and we know what precaution is taken for maintaining the stability of the central tower that supports so moderate a surface as that exposed by the vanes of a windmill. Speaking without having made that mathematical calculation, for which it does not come within our province to assume the responsibility, and thus with all proper reserve, we should conjecture that piers of dry bricks, set on the present bases, would be overthrown by such a storm as that of which we have the proof before us. The stability of the piers, if that be so, would depend altogether on the adhesive quantity of the cement in which the bricks were set. We do not say that this is inadequate, but we desire to call attention to the fact; and we think that some attempt to prove the pressure of a statical equipoise, not altogether dependent on the adhesion of each course of bricks to that below it, considered as resisting not a sliding, but a lifting motion or tendency to move, ought not to be left out of consideration. We cannot afford to run any more risks, and the disproportion between the height at which the side pressure comes on, and the lateral strength of the pier, lies at the very basis of danger.

[Since the above was written, the Select

Committee have reported that, having regard to the safety and security of the public, they do not feel justified in sanctioning the scheme which the Bill proposed. The Bill was therefore thrown out.]

THE MANUFACTURE OF FURNITURE IN GERMANY.

THE development of the manufacture of furniture during the last decade formed the subject of a lecture delivered by Herr Carl Behr, the manager of the furniture manufactory of Herr A. Bembé, at Mainz. Being of general interest, we give an abstract of the lecture from the German version of it.

Furniture represents those products of art industry which interest us in, perhaps, a far greater degree than other objects which we use, because they immediately surround us, and appeal directly to our sense of domestic comfort. For this reason it has been ever the endeavour to produce furniture of tasteful design; but it has been reserved to modern times to make real progress. About ten or fifteen years ago the furniture industry of Germany was at a very low ebb, and it was accompanied at the same time by an aberration and absence of taste which were most surprising. Furniture was made in Germany either in simple or heavy forms, or else in absurd imitation of French models. The French then, as now, were in the habit of resuscitating the various styles of the past, according as the taste of buyers happened to change. It was a great defect in the manufacture of furniture in Germany that most makers worked without models or drawings, and that with the introduction of new wood-working machinery the traditionally delivered forms were gradually transformed without any regard being paid to the beauty of the whole composition. One of the most flagrant aberrations of taste at that time prevalent in Germany, greatly encouraged, it must be owned, by a large demand for the article, was the manufacture of so-called old oak furniture. The way in which that class of furniture was produced was most barbarous, machine-made naturalistic ornaments, such as fruit, objects of the chase and still-life, &c., being stuck on to the smooth surfaces of the wood, without any regard whatever to the harmony of the whole composition.

Many technical journals of the better class, such as the *Oesterreichisches Museum* (Vienna) and the *Gewerbehalle* (Stuttgart), fought hard against that practice, and exhorted makers to return to a legitimate production of such work, urging that this might best be achieved by an adherence to the forms of the German Renaissance, as being most in accord with the taste of the people. But it was reserved to the time of national re-awakening, the years of the war of 1870-71, to give an impulse to the endeavours of regaining the lost prestige in art-industry by the adoption of those long-neglected forms. An improvement was noticed as early as the Vienna Exhibition of 1873. But of especial influence in the development of the manufacture of furniture in Germany was the Exhibition of the Bayerische Kunstgewerbe-Verein of Munich in 1876, a society which has done inestimable service in raising German art-industry. That exhibition pointed the road to be taken, and enabled a more uniform system to be pursued. From that period dates a steady and speedy development of this industry, which was demonstrated at a series of important exhibitions, such as those of Hanover, Berlin, Leipzig, Offenbach, as well as smaller local shows. The foundation of new art-unions and the increased activity of already existing ones contributed considerably to this development.

The author next considers the work of French makers of furniture as shown at the last Paris Exhibition, and compares the French and German modes of manufacture.

The furniture of Paris manufacturers,—the makers of other French towns being far behind them,—is distinguished by a perfect execution of the separate parts, a harmonious effect of colour and ornament being likewise aimed at. Most of the furniture, however, is of such an expensive nature as would prevent its sale in Germany; prices ranging from 20,000 to 25,000 francs for some articles being not at all rare. The workmen are consequently very highly waged; it is a fact that clever men are paid at Fourdinois', in Paris, as much as five francs per hour. But it is a remarkable fact that German workmen execute the best work in Paris establishments, though they have no opportunity, on their return home, to make use of their acquired skill.

In the design and composition of French furniture, however, there is a striking absence of the noble forms of the Renaissance, the place of which is taken by the pompous shapes of the styles of Louis XIV., Louis XV., and Louis XVI.; here and there, also, the more sober one of Henri II., in the development of which the French have achieved extraordinary things.

If we compare the work of French furniture-makers of the present day with that of the same class from the end of the sixth decade of this century, it will appear at once that there has been an undeniable standing still. If we compare with this the great strides made by Germany, the time will not seem very far distant when the German furniture industry will be able to compete with that of France without misgiving. This highly favourable state of things has been effected principally by the foundation of societies and the holding of art and industrial exhibitions; yet its fuller development has to some extent been hindered by an absence of artistic feeling on the part of the general public, which can only be created gradually by a more universal training in the elements of art. This artistic understanding is being by degrees instilled into the public mind of Germany by the exhibitions already mentioned, but it might be still further stimulated, the author thinks, by very elementary means, such as rational, systematic instruction in drawing in all schools, for example. The practice of having work which might well be done at home executed by foreign hands, and of submitting it to public competition, according to the author also affects injuriously the growth of the art-industries in Germany.

The author endeavours finally to demonstrate that the utilisation of German Renaissance forms in the manufacture of furniture of the present day is highly advisable, for various reasons. The Italian Renaissance is intended for another climate, other conditions, and other manners, and is especially not to be recommended for Germany from pecuniary considerations; for by dispensing with rich carvings, &c., part of the original characteristics of the style is lost. The art-workman must study all styles which have been artistically developed, in order to be able to appreciate their excellencies, and to keep from falling into the mistake of onesidedness. To do this successfully requires study and application: study alone will make it possible for him to adapt and utilise the styles of former times for the artistic requirements and to the changed wants of our age. Study classic models, but impress your own ideas on your work: such is the advice of the author to the art-workman. This alone will guard him against monotony and repetition.

ROYAL ACADEMY SPECULATIONS.

HOWEVER indifferent as compared with some other nationalities a large portion of the British public may be to art and art influences, there can be no doubt of the interest felt in the annual Royal Academy display of pictures. From the day of opening to the day of final closing, these rooms, so full of pictures, are constantly and incessantly crowded with eager and anxious spectators. It cannot be said that the public care not for individual pictures, or for the detailed incidents and information contained for the most part in them, for all have catalogue in hand, and are found perpetually to refer to it, not only for mere titles, but for more detailed information, when such is to be found. Much would, indeed, be missed, and would disappear, were this annual art-show to cease, and the art-public would be not a little at a loss to find a substitute for it. It is looked forward to for long months with eagerness, and when the time of opening does arrive, this exhibition of the art-work of the year is found to afford the means, as far as it goes, of testing the artistic capacity of the time, and of ascertaining the bent of the public mind as to art; and we then see how this has been responded to, and how far the art-strength of the time is equal to the work before it, and how the work has been done. It may be of interest, then, to glance back for a moment on this fine-art show, and to ponder for a moment on its general tendency and influence.

But more than this: from all sides there is a constant series of criticisms and explanations, more or less exhaustive, of the subject matter of at least the principal pictures. No one, thanks to this, can be at a loss as far as explanation goes, and as far as such can compel the intelligent looking at a fine work, whatever the subject of it. Most people go to the Academy rooms to look at the pictures as art objects, and as representations of actual things and occurrences, and at such in the main as the time has furnished,—the living men and women, and the objects they are interested in. When the exhibition is over, a good deal of this passes away, and is forgotten, and the next year's show is as anxiously looked forward to as was the last and past one, and for the same reasons. It is hoped on all sides to see a something fresh, a new face, and graceful forms in new and present fashionable costume, and new views of distant places and buildings, and, in short, to see, as far as pictured representations go, or can afford it, what the world is doing and looking like. That the Royal Academy annual show does this none will dispute, and that it does it in the main well; but that a something and a somewhat more than this might be accomplished, and the public further pleased and instructed, there can be but little doubt. It is a somewhat singular thing, and difficult to account for, that all sketches so called are inadmissible.

It must not be concluded, as perhaps many do, that such a display of pictured art is altogether new, and of modern and all but of to-day's growth. In Gothic days there was and must needs have been its equivalent,—in days wherein the artist worked immediately on every new building of public importance and destined for a public use, as the great cathedrals and churches, every such structure formed the ground or "canvas" on which the painters and sculptors and great draughtsmen worked, and the opening of any such building, as we know, was always the occasion of calling together an art-loving crowd to see it, as a famous picture is nowadays viewed. A newly-drawn and painted cathedral window must have been as the "picture" of the season, such being, in less enlightened days than these, the personal handwork, as well as the brain-work, of the artist workman who produced it; and it was most certainly the window itself *in situ* that was the special object of curiosity and admiration, and not a small and mere representative drawing of it on the walls of a room that the eager crowd went to see. We may pause a moment to say that perhaps but scant justice has been done to the great artists and painters of the glass of the Middle Ages. It is at times magnificent in its fine sense of colour and harmony.

That this was so in antique and classic days there can be no sort of doubt. There were and must needs have been exhibitions every now and then of such doings as these, and every new and at all important building must have afforded opportunities, during its execution, of art displays of the kind. We have always thought, though the thought may be perhaps a little fanciful, that, looking at the mind and character of the Greek race, it would have been well nigh impossible for the people of Athens to have had always before them such magnificent works in course of construction, and afterwards their *decoration*, and so great a master as Phidias, without periodical visits to the scene of his labours, and without keen comment on the value of them. Surely each one of the magnificent forms which together made up the story of each pediment of the Parthenon must have attracted an eager and art-loving crowd to look at it, and to wonderingly admire it, and in not a few cases to study it. Indeed, it is difficult to see how this could well, among such a people, have been otherwise; for, looking at the way in which such works were designed and put together, and the perpetual and ever-present personal activity of the architect and artists who designed and built it, it would have been strange, indeed, if such working artists had not had a vast following of students and others equally interested in it. It must needs have been as an academy,—always open, and wherein not only were the works of the artists always visible, but they themselves were always to be seen at work. A great school of art indeed!

Thus we may fairly say that this exhibition of the Royal Academy has had its predecessors in antique days, though, in all probability, so very different in external aspect and surroundings. Much more, we cannot but think, might yet be learned about this by a little further and deeper looking at and into that distant past of art displays; and it might, may be, lead to efforts to make this art-show more general and even more useful

as a national and high-art display and record of what is doing, and has yet to be done. At present, and as matters now are, it is for the most part confined to paintings in oil for the decoration of rooms and private apartments, and certainly without any wide idea of "interpretation" of any kind, as Turner undoubtedly had when he commenced the famous "Liber Studiorum," of which remarkable performance a good deal has yet to be said. The idea, evidently, of this great interpreter of Nature was throughout, to represent Nature in all her aspects, and as he saw them, and was gifted to interpret them, and it would seem a matter of some regret that so good and potent an example is not followed, and that some systematic interpretation of Nature's infinite work is not attempted. We forbear details, which might lead us far, but commend the good example to those who might follow it. In this Academy Exhibition there was a large number of landscapes and "views," and transcripts of Nature's forms, and not a few of them evidenced the skill and high faculty of those who produced them. A wild flower, in how many, many ways, it may be interpreted!

We are here simply looking back at this picture and art display generally, and so must needs avoid the naming of special pictures of whatever kind; but it may be further observed of these landscapes and views, and hedge-rows, that the painters of them would seem to have avoided the naming of the places where they were found, *e.g.*, "A Thames Breakwater,"—but whereabouts in the long length of the river? Many might like to see the spot itself. The "Beached Margent of the Sea." "On the Coast of Cornwall." "June." "An October Evening,"—but, where are these? and a host of others, all of them evidently taken from some one or another attractive spot, which, if worth the painting, is and must be worth the seeing, and the knowing a somewhat about. A famous picture in a former exhibition, and one which most readers well remember, as evidence of what its painter can do when the fit takes him,—"Chill October,"—whereabouts was that scene, in what part of the wide expanse of England? Surely a fact is worth stating, and where is the picture now? It might well have been made national property. But this in passing. There was here, too, "God's Shrine," but where? and a "Woodland and Stream," and of sea-views no end, but whereabouts, who shall speculate? The "Sea" surely is always worth the painting; it ever varies, no two hours alike, and to present a vivid idea of it on canvas is and must be a notable feat, in whatever state, whether of calm or storm, to accomplish. But why not say where painted?

And this again leads us to a thought or two on what, perchance, might prove a useful addition to the present somewhat narrow professional Academy programme. Might there not be one small room devoted to the exhibition of what are called "Sketches," and first thoughts on great subjects? "Sketches" are not, as is known, as matters are at present, permitted; none but pictures worked close up to the gilt frames, as though there was a something of import in the hard outline of the frames. Sketches and first thoughts are of no small value at times, and some of the finest and most valued of the thoughts of the great masters left us are in the form of sketches, whether as memoranda, or as complete work, as at times is the case. We need not cite examples of this: they will readily occur to all, and certainly to those who strive to look into the minds and methods of the great masters of the painter's art. No one, we think, who has been privileged to look through the portfolio of a painter or a sculptor but must have wondered at times at the skill and power of expression exhibited in these may be hasty "sketches," and sometimes, too, at how much has been lost of this in the more finished and completed picture. We believe a single room, or even one wall of a room, thus filled would be most attractive, and would, perhaps, afford to the expert what the more completed and finished work fails to do. It is thus well to look back sometimes.

Bachelors' Ball at Kensington House.—The decorations and illuminations on this occasion were on an unusual scale, and were carried out by the firm of J. Defries & Sons. The effect was remarkable. The terraces, gardens, lake, islands, &c., were outlined with variegated lamps artistically arranged, and festoons of myriads of Japanese and Chinese lanterns were spread from tree to tree and every point of vantage.

FINE ART EXHIBITION AT TURIN.

THE building erected for the exhibition of Italian works of art at Turin is described, by the *Giornale dei Lavori Pubblici e delle Strade Ferrate*, as presenting an aspect that is at the same time light and severely artistic. It forms a quadrilateral, 215 mètres long, and 70 mètres wide; the principal front, which looks eastward, on the Corso Siccardi, being on one of the shorter diameters of the parallelogram. The elevation consists of a great arch, surmounted by an attic story, and two arcades, of three arches each, supported by coupled columns. The most elevated part of the façade is 21·65 mètres above the ground. In the lunette formed by the central arch, Professor E. Gamba has painted a fresco design, representing the Coronation of Italian art. The main entrance into the central hall is divided into two by a column, an arrangement which has encountered not a little criticism. In the middle of the terrace before the building is a statue by Vincenzo Vela, representing Minerva with a crown in her hand.

Signor Calderini, of Perugia, is the architect who gave the first design for the building to the committee for the exhibition. The great central gallery is divided on its sides into sixteen compartments. It is 130 mètres long. In the centre is a large octagonal chamber, destined for works in sculpture alone. Four large rooms are placed at the end of the gallery, and the octagon, the four end chambers, and the sixteen compartments, will be occupied by architectural designs. The sculpture gallery and the four saloons are illuminated from above; the lateral rooms have large windows on the sides. At the west end of the building a gallery is in progress, which is intended for the display of objects of industrial art. It surrounds on three sides an open court, in which is a *chiosque*, surrounded by flowering plants. Rooms are included in the building for the committee, the secretaries of the societies connected with the exhibition, the press, the post and telegraph, the attendants, the fire brigade, and the guards, as well as two larger spaces for the use of the purveyors of refreshment.

PROPOSED TUNNEL UNDER MONT BLANC.

THE French Government, if we may rely on a statement recently made to the "Society of Engineers and Industrial Persons of Turin," is seriously occupied in the consideration of a tunnel under Mont Blanc, and has commissioned M. de Lepinaye, inspector of railways, to draw up a comparative report as to the various passages through the Alps that are either completed or in prospect, stating the advantages and disadvantages of each, as to distance, gradients, and cost of construction.

According to this report, the distances between Paris and Piacenza are as follow, by the different routes indicated:—

		Kilomètres.
Mont Cenis route	by Turin and Milan	992
" "	by Turin and Alessandria	915
St. Gothard route	by Basle and Milan	975
" "	by the Jura-Gothard line	935
Simplon route ...	by Novara and Mortara	905
" "	by Milan	914
Mont Blanc route	by Vercelli and Broni ...	886

Adding to the actual horizontal distance the proportionate lengths which are equivalent to the heights overcome by the gradients on the respective lines, the following are stated to be the results:—

From Paris to Piacenza the Mont Blanc route has an advantage of 40 kilomètres over the Simplon route, of 53 over the St. Gothard, and of 72 over the Mont Cenis routes.

From Paris to Milan the Mont Blanc route has the advantage respectively of 14, 23, and 86 kilomètres over the Simplon, the St. Gothard, and the Mont Cenis lines.

From Paris to Genoa the corresponding advantages of the Mont Blanc route are 75, 159, and 43 kilomètres over the before-cited three other lines.

With regard to cost, allowing the sum of 4,086 francs per mètre for the principal tunnel, and that of 400,000 francs per kilomètre for the line from Aosta to Courmayeur, and adding 18 millions for the headways and for interest on capital during construction, the total is brought out at 90 millions of francs for the trunk line from Aosta to Chamounix, effecting an economy of 30 millions of francs over the Simplon line. There is the further great advantage that the extreme length of the Mont Blanc tunnel is under 13,500 mètres, while the Simplon tunnel measures 18,500 mètres.

From the recent experience in the St. Gothard tunnel as to the illness caused among the workmen by the heat, it is considered by the advocates of the Mont Blanc line that it must be almost impossible to execute a blind bore, or tunnel without a shaft, of 18 kilomètres in length, at all events, without great improvements being effected in the present means of ventilation. The shorter length of the Mont Blanc tunnel presents a great advantage in this respect. It is calculated that the heat developed at the face of the work in proportion to the depth of the gallery beneath the surface, will not exceed 33° Centigrade (or a little over 90° Fahrenheit). Signor Garola expresses the hope that the valley of Aosta, which has always been the gateway for the invaders of Italy, ancient as well as modern, may open a route for a peaceful and enriching traffic.

FROM THE BANKS OF THE SEINE.

THE Working-men's Congress, held during the last week here in Paris, cannot be said to have been wanting in the element of exciting interest. Entire liberty has been wisely accorded by the Government to these "revolutionary collectivists," as the members of the Congress term themselves. The idea was an excellent one, that of a Working-men's Congress; and very interesting and valuable would it have been to hear from the lips of a number of intelligent artisans their views on the existing state and working of the modern question of capital and labour; but, unfortunately, a revolutionary and murderous political element has been introduced into the discussion, and each day's doings have merely served to register the tame re-expression, in slightly altered terms, of the same unmeaning imprecations against the existing state of society, which all agree must be abolished, but as to the re-constitution of which no two are of the same opinion. The very first meeting, presided over by two "citizens" and a "*citoyenne*,"—for the female element has taken an important share in the congress,—declared itself unanimously "revolutionary collectivist, that is, resolved to take by force and divide the manufactories, the guilds, the machinery and tools, and the capital." Day after day has seen a series of delegates express their views, and tediously do they all coincide on the iniquity and exaction of the capitalist. Had these discussions possessed a cool and reasoned tone, much that was interesting and instructive might have been arrived at, for how is it possible to deny that the relations of capitalist and labourer are far from being in a satisfactory condition in France? Unfortunately, the question was not to be enlightened by such excited views, in which the continual repetition by delegate after delegate of the most violent revolutionary proposals became tame, even when there was no want of open reference to armed force, petroleum, and picrate of potassium. Throughout all this sad enunciation of the supposed sentiments of the French working-man, it is encouraging to feel how little these views can express those of the mass of the artisans of France. The Congress is attended by a very meagre number of representants of the working-men's "groups" of the country, and the large majority of the delegates are the agents of avowedly socialistic societies, or, as they are termed, in a somewhat more dignified manner, "clubs of socialistic study," many of the members of which have, we are afraid, little in common with the sturdy working-man. A further feature in the congress is the female element. Certainly in a working man's congress the all-important question of the rights of woman as a joint labourer, and therefore a large factor in the consideration of the social question, has its natural place; but in the purely political current into which every discussion has drifted, the female element, particularly when presiding, seems strangely out of place. Politics, indeed, seem to have driven out all the other interests, although the questions of salary, masters and men, apprentices, education, general education, the number of working hours, the necessity for co-operative societies, and many other such practical subjects worthy the attention of a working-men's congress, were settled for discussion. One special feature of the whole meeting

has been the loyal and courageous protest of the delegate from Havre, M. Drouet, a sail-maker, who, having presented an excellent programme, divided into twenty-one heads, in which were formulated a number of appropriate questions for consideration, found this admirable document entirely rejected by the congress, on the score of the want in its tone of revolutionary violence. To rouse the enthusiasm of the delegates, the more skilful of their clumsy orators have been obliged from time to time "to lay it on pretty thick." Disgusted with the ultra-political tendency of the discussions, and the sanguinary and ferocious threats and proposals put forth against the hated "bourgeois" and the capitalist, M. Drouet expressed his warm indignation in a declaration which has won for him the respect of all thoughtful and well-intentioned persons. Stigmatising "the brutal theories and ridiculous Utopias" of his fellow-delegates, he roundly blamed those about him for their folly in believing that the French nation would ever in any numbers follow their advice. Claiming his privilege as a delegate, and therefore entitled to be the spokesman of those who elected him as their representant, M. Drouet nobly ended his protest by the following words, which deserve the attention of every workman and employer:—"You expect us to follow you—No, a thousand times no. It was our belief that we were about to assist at the development of practical theories conformable to sound reason, but you ask us to aid you to carry out unhealthy, absurd Utopias. Citizens, in the name of the workmen of Havre, and of all those who freely, without concealment, desire to arrive at true progress through right and justice, we repudiate your principles, and before quitting this tribune I consider it my duty to declare that I, Ernest Drouet, sail-maker, delegated from Havre to this Congress, protest by this declaration, and withdraw."

At the present moment, when the flood of passengers,—English and American,—between England and the Continent is setting in with its usual force, it is quite seasonable to hear of the recent visit of M. Léon Say to Dover to inspect the progress of the studies for the proposed sub-Channel tunnel between France and England, and the journey, almost on the same day, of the French Minister of Public Works to Sangatte, near Calais, where the French society, which is studying the tunnel difficulty, have sunk a well. From the report issued by the South Eastern Railway Company, it would appear that the geological strata are not only in exactly the same position, but are of the same thickness, on both sides of the Channel. Everything, therefore, points to the success of the project in a comparatively near future. As very apposite, we may bring to the knowledge of those interested in the question the work recently published by Prof. Hebert, "L'Histoire Géologique du Canal de la Manche." M. Hebert has devoted many years of deep research to the study of the successive modifications of what is known as the "basin of Paris,"—a vast extent of country comprised between the central plateau, Brittany, the Ardennes, and confined by the shores of the British Channel. The Professor is familiar with every feature of this district, and he has collected at the Sorbonne specimens of all the rocks, the remains of all the life of the past which has occupied the district. Aided by this evidence, M. Hebert has been able to form the history of the changes through which this important region of France has passed. The arm of the sea which at present extends between France and England, and which unites the Atlantic with the North Sea, has only (comparatively) recently assumed its now familiar aspect.

The lawsuit connected with the statues at the historic Château de Menars, said to belong to the State, has again come before the courts. As can be imagined, the case has brought forward some curious details,—not least interesting among these the insight into the peculation of the too-famous Poisson de Marigny, the relation of the Pompadour. Taken by him from the royal galleries, and placed in his château of Menars, a number of statues of more than usual merit are the subject of the present lawsuit, which is by no means yet terminated; the State claims its interest in these statues—a claim which, at the beginning of this century, was put forward by Pajon the sculptor, then curator of the national antiquities; but the property of Menars having passed through a variety of owners, difficulties have arisen in the arrangement of the question. Are these statues the property or not of the State? is the point which has to be settled, and which, from all appearances, will be a somewhat lengthy question to satisfactorily determine.

This dispute serves admirably to show the value of the commission formed six years' since to prepare an "Inventory of the Art-Treasures of France," already noticed in these pages. One by one the volumes of this excellent Government publication are appearing. Perhaps of all the attempts made within the last generation in favour of the arts, the most successful and the most durable, the most likely to lead to unexpected results, is the formation of this inventory. The idea once thrown out,—only in 1874,—was eagerly taken up, and the various prefects, mayors, and directors of provincial museums and learned societies, were communicated with, and their duties assigned. While the information was being collected, the Commission prepared a volume containing an inventory of the art-treasures of twenty-seven of the churches of Paris. The second volume, published not long since, contains monographs of the library of Versailles, the church of St. Sauveur at Chalons, and the hospital of the same interesting old town; the modest museum of Chalons has a chapter devoted to it, as also the museum of Orleans and that of Montpellier. These three monographs alone would suffice to show the intention of this inventory, the writers not confining themselves alone to a mere inventory, while at the same time they have not neglected to observe the conciseness necessary to such a work, nor yielded their claim to the right of criticism to which their knowledge of the treasures under their care has entitled them. The claims of more than one doubtful or ill-assigned object are in this manner corrected, and the work is by this means rendered invaluable. The third volume of the inventory has only very recently made its appearance. It is devoted to the civil monuments of Paris, and contains a series of curious monographs of the Institute, the National Archives, the New Opera-house, the Palais-Royal, the French Théâtre, the Fountains, the Arc de l'Étoile, the Column of July, and the Place Vendôme. Already it will be seen what an interesting and considerable start has been made, and this is easily explained by the fact that the information existing had only to be gathered together, each curator knowing (he is superintended by a sub-commission) the contents of his museum, even when there exists no printed catalogue. The idea merited the success which it has met with.

MORTALITY IN MINES.

FAR too frequently the British public is startled by the report of an appalling disaster and the loss of many lives by an accident in some mine, oftenest a coal mine. Such a disaster has just taken place; and at the same time we have in the official reports of the Inspectors of Mines a series of facts published that show the comparative frequency of accidents in mines in the several mineral-yielding districts, and the extent of the loss in a year; and the teaching of these official statistics is that whilst the proportion of the fatal accidents in mines is being reduced from time to time, yet there is not the reduction that there should be in the losses from explosions of fire-damp, the most deadly of the enemies that our miners have to meet, and the one which is the chief cause of the loss of life that is from year to year tabulated.

Taking a series of years, we find that the truest test of the safety of our mines is not the number of accidents, nor even the number of lives lost, but the proportionate loss of life to the quantity of coal produced. During a series of years, the number of lives lost by accident in and about the mines classed under the Coal Mines Act has varied from 970 to 1,500, the number for last year being 973. During the years over which these figures extend the production of coal has been increasing by the opening out of additional pits and the greater output from some of the old ones. If, instead of looking at the number of deaths simply, we test over long periods the number in proportion either to the number of workpeople employed, or to the amount of coal produced, we shall find that the fatalities are fewer. In the ten years between 1850 and 1860 the proportionate loss of life was 1 to every 245 persons employed; in the succeeding ten years it fell to 1 to every 300; and in the subsequent years, not yet a full decade, the ratio has been still more satisfactory,—about 1 to 430.

And it is also satisfactory to find that the general opinion as to the extreme danger in coal-mining is not well founded,—for other employments have risks as great, and even greater,—the loss of life at sea being greater both in the Royal Navy and in the merchant service, whilst also in proportion to the number employed the mortality in the railway service is greater. It is in the loss of life in mines by explosions of fire-damp that the most unsatisfactory state of affairs is found in the mining mortality, for the average number of deaths per year is greater now than it was a score of years ago, and the proportion that these deaths bear to the production is not diminished. It is in the unequal incidence of these losses that there lies the cause of the very great disparity in the mortality of the several mining districts,—the mortality in Wales being thrice as high as that in the great coal-mining district of northern England.

Since the awful accident at Hartley Colliery, nearly a score of years ago, the north-eastern coal-mining district has been free from great fatalities of that nature; but Wales, Lancashire, and Scotland, and one or two other districts, have suffered at times severely. Some of the most eminent mining engineers entertain different opinions as to the causes of that great discrepancy in the relative danger of the respective districts; but it is generally believed that in great part it is due to natural causes,—to the different classes of coal mined, and their varying yield of inflammable gases; to the supposed increase of danger at certain depths of mines, and to other allied causes; but it is remarked by some of the Government inspectors that in certain districts there is not that strictness in regulations that there is in others. Thus, one of the inspectors reported that in his district last year causes, other than natural, of serious losses were, "the manner in which gunpowder is used; the custom of depending almost entirely on the colliers themselves to keep the working-places safe; and the want of discipline and definite instruction as to the examination and use of safety-lamps." And in another the inspector complains that the men in the mines do not avail themselves sufficiently of one of their permissive powers to make periodical examinations,—the use of which he thinks would tend to increase the safety of the mine; and another reports that out "of seven lives lost by explosions of gas, not less than six were brought about by carelessness." It is useless to make suggestions as to methods of minimising the danger in mining, for what suits one district does not necessarily meet the wants of another. But this much may be said, that when there is in any district a mortality above the average, and when there are serious losses of life, the inquiries that follow might legitimately be extended to the consideration of the question whether the method of working, or the regulations, are capable of being amended by the experience of those great districts whence large quantities of coal are extracted without very serious loss.

THE COAL SUPPLY OF LONDON.

ONE of the largest of the coal consumers of the world is the great metropolis, and though there are occasional interruptions to the growth, yet from year to year the tendency of the consumption is upwards, if not steadily so. From eight to ten million tons of coal are yearly brought into the metropolitan district, and though a portion of this is sent out, yet the consumption of coal within the metropolis is astonishingly large; and the growth of that consumption is one of the causes that have contributed to the increase of the output of coal in the kingdom, and which has added thirty million tons to the production of the kingdom within the last fourteen or fifteen years. One of the checks to the growth of the consumption of coal in London has taken place in the present year,—a temporary one, after a year of very marked growth,—so that the present is not an unfair indication of the extent of that consumption, and of the sources of that supply of fuel for the fires of the metropolis. It may, therefore, be interesting to ascertain from the official returns the quantity of coal brought into London, and that retained apparently for consumption. In the present year there appears a change, too, in the method of carrying the coal, and it is possible that other changes impend in the

future in this respect. During the first six months of 1880, there were brought into the metropolitan coal district not fewer than 4,789,000 tons of coal,—a quantity less by 100,000 tons than that brought in during the corresponding six months of last year. There are two great methods of importation of this coal into London,—by railway and by sea,—the amount brought in by canal being now so small that it may be dismissed with the remark that it rarely exceeds on the average 400 tons in the month. That small quantity is usually included in the returns with that of the great bulk,—that brought by the railways. Since the introduction of the railway system the quantity of the coal carried thus into the metropolis has grown until it far exceeds the quantity brought in over sea. In the first half of 1880, there were brought into London by railway 3,088,933 tons, and this amount even is much less than that brought in by that method in the previous year. On the other hand, there was an increase in the quantity brought in by vessels. During the first six months of 1880 there entered 2,586 ships' cargoes of coal,—the tonnage being 1,780,782 tons. We have thus the large quantity of over four and three-quarter million tons of coal entering the metropolitan district. But from this there is to be taken the railway-borne coal which merely passes in transit through the metropolitan district, as well as that sent out of the district either by canal, rail, or vessel. In these varied methods, 1,193,915 tons of coal were sent out of the limits of the metropolis during the first half of the present year, and in the remainder we have the apparent consumption of coal of the great city. That consumption, then, was rather over 3,500,000 tons in the six months,—an immense burning of fuel; for though no small part of it is used at the gas-works in the production of gas, yet the latter is becoming more and more a fuel as well as an illuminator, and the coke which is produced is also a fuel.

The sources of supply are only indicated in part; that railway-borne is told so far as the railways that bring it in are concerned, and the source whence that brought in by vessel comes is shown by the port from which it is sent. Taking the railway-borne coal, we find that the Midland Railway stands at the head of the companies which bring coal into the metropolis, its annual contribution being about one and three-quarter million tons, of which no small portion is derived from the coal-field of Derbyshire and South Yorkshire. Following this is the London and North Western Railway, the average quantity of coal brought into the metropolis by which is about 1,250,000 tons. The third place used to be occupied by the Great Northern Railway, but the increase of the great coal trade of Wales has enabled the Great Western to take rank immediately after the London and North Western, with a contribution of a million tons of coal in round numbers, and the Great Northern closely follows, though its coal is from an entirely different quarter—from Yorkshire and Derbyshire. The only other large contributor is the Great Eastern Railway, which brings its 600,000 tons yearly. In addition, slighter quantities are added by the London and South Western Railway, and by the South Eastern, and London, Chatham, and Dover, and thus the total of the railway-borne coal is brought up. Of the sea-borne coal, it is clear that the great bulk comes from the northern coalfield. From Newcastle-on-Tyne alone, one half of the sea-borne coal entering the metropolis is sent. Next follows Sunderland, which ships some 890,000 tons; and then, but at some distance, West Hartlepool, whence 350,000 tons are yearly sent to the metropolis. The little port of Seaham Harbour takes the fourth place, sending as much as 200,000 tons yearly, but Middlesbrough, Blyth, and other ports send small additions. The entire yearly contribution of Scotland is about 50,000 tons, and that of Wales 20,000 tons, these districts finding other modes of carriage or other markets. It is evident, however, that changes impend in the mode of conveyance of coal to the great city; there are now being constructed docks at other parts of the east coast, with the view to the supply of coal by other districts over sea to the metropolis, and with these there is a certainty of a reduction in the rate of carriage by rail, so that it is evident that there will be a struggle for the supply of the great coal-market both between the various districts and between the different methods of conveyance. It is impossible to indicate the method in which the coals sent to London are used except in outline. It is certain that two of the largest consuming sources are for steam-power and for the manufacture of gas. In comparison with that of the country as a whole, the consumption for the purposes of metallurgy is very small, and for manufacturing purposes it is less in proportion probably than in the Lancashire district, so that to the two methods of consumption that of the demand for household purposes will probably be next greatest. It is, however, clear that the consumption must increase: steam power is more and more used; and despite the electric light, the area for the use of gas is growing, both for purposes of heat and illumination, whilst the extension of the metropolis year by year enlarges the demand on the coal-pits of the kingdom, and large as has been the addition to the quantity of coal needed to feed the fires of London, it is certain that in the future that growth will continue, if not with an increased rapidity.

THE SANITARY MEETING AT THE MANSION HOUSE.

Is it possible to make sanitary subjects popular: that is to say, to get up that kind of interest in them which will induce people to flock to a meeting for considering such subjects just as they would to the benefit of a popular actor? There is no doubt a greater interest is felt in sanitation now than there ever has been in this country before, as far as we know; but we fear it is not so great as it sometimes appears, and we know it is not so great as it ought to be. People have theoretically recognised the fact that such subjects have to be considered, and they know that it would be thought foolish to refuse to listen to their consideration merely on the ground that they were not proper subjects for refined people to talk about,—which was the old feeling; and it is possible, as the Mansion House meeting on Tuesday showed, to get up a very fair meeting to hear a report on the subject. But we surmise that those who form the audiences at sanitary meetings are mostly part of a small band; that they are to a considerable extent the same audience at one meeting as at another. The real interest in the subject has not spread beyond a small circle.

It is desirable for the present, however, that hygiene should be popular, because it is only by its becoming a subject of popular interest that any great or rapid improvement can be made in regard to evils which it is so difficult to get at in detail, and which are so much under the control of individuals of all classes. It is not, be it admitted, a natural or even a healthy state of things that sanitation should be an object of popular interest and general conversation. As with the health of the individual, so with that of society. There is the least need to talk about it when it is in the best and soundest condition. A man in thoroughly good health does not think about his digestion, or whether this or that will agree with him,—it is a matter of course which goes on regularly in the order of nature. But let his digestion be impaired, and the subject becomes a matter of interest to him, and he is desirous to know what food is good for him, and what is not, and if he is very far gone, he will even discuss the subject with his friends as if it were necessarily an agreeable and interesting topic of conversation. Cure him of his dyspepsia, and he will cease to think about digestibilities and indigestibilities. At present we are in the condition of the dyspeptic man. Our sanitary stomach is out of order, and it becomes a matter of serious general interest to know what will agree with it and what will not,—what will cure us and what will not. The difference, however, between society and the individual is, that the latter much more easily knows what is the matter with him than the former. The individual has unmistakable personal pain and discomfort which render it impossible for him to ignore the fact that he is in an unhealthy state. But of the members of a society only a comparatively few may actually suffer severely from an evil from which, nevertheless, they are all nearly equally in danger. Those who are not conscious of having suffered themselves from sewer-gas, or who have lost no beloved relative through its influence, are not immediately spurred on to inquire into the subject; and even those who have so suffered are often not aware of the real origin of the disease or death which has spoiled their lives or destroyed that of their friends. The position of many of the public in regard to the danger of ill-arranged or defective drainage is something like that of the sons of Duncan after the murder, who come in and ask innocently,—

"What is amiss?"

and we have to answer them again in much the same words as Macbeth's,—

"You are, and do not know it:
The spring, the head, the fountain of your blood
Is stopp'd; the very source of it is stopp'd";—

or if not stopped, at least poisoned. And until this is generally understood, it is well that sanitation should be talked about and popularised as much as possible. There are three classes of persons, at least, in connexion with house property, whose attention has to be awakened, and whose conscience must be acted on: the landlord who lets the house, the tenant who lives in it, and the workman who makes it. We wish there were not too often reason to add, and the architect who plans it; but we fear he cannot as yet be allowed to go scot-free: and when he does neglect the subject, his neglect is of course the most blameworthy of all, not only because he ought to feel bound to understand what are sanitary conditions, and provide for them, but because even when his education in this respect has been neglected he, at all events, knows where to go for information, which the landlord and tenant mostly do not. As to the unfortunate workman, he is perhaps more sinned against than sinning. It is some gauge of the deficiencies of his education when we find that even the foreman of a gang of gas-labourers did not know under what circumstances gas was explosive. How was he to know, poor man! No one had ever taken the trouble to tell him. We fear, however, it must be added that the average working-man, even if he had been purposely instructed as to what he ought to do, has not by any means developed that sense of responsibility which would induce him to do the right thing merely from a sense of duty and without being compelled to do it by an unremitting supervision. When we have developed in all these classes of persons the knowledge what precautions are necessary to make a house healthy, and the determination to carry out the conditions as a matter of course, then we may concede that such questions need no longer be matter of popular discussion. They are not in themselves of popular interest, provided they are going all right; but until they do so, it is necessary to endeavour to popularise them in order to get them attended to at all.

It was therefore a wise move for the committee of the Parkes Museum of Hygiene to give a public character to their first annual meeting. There was, we believe, some doubt in the minds of some of those connected with the institution as to whether it was desirable at this time of the year to attempt so public a celebration of the mere termination of the first business year of a museum which is as yet quite in its infancy and has attained no separate residence. But we are sure any of those who were doubtful on this head will agree that the result justified the attempt. The meeting at the Mansion House was a larger one than, under the circumstances, many persons expected, and now the idea of its being a public concern is fully established, and we can have no doubt that, on the next occasion, an even greater interest will be manifested by even a larger attendance: we hope, we may add, by a longer subscription list. In respect of pecuniary matters, certainly, the result of the invitation for subscriptions on the spot was not a brilliant success. One reason for a certain caution in subscribing we take to be the feeling of doubt as to the future home of the Parkes Museum, the present habitation of which is admittedly only temporary. It is on this account partly that we urge on the trustees of the Parkes Museum the advisability of putting into shape without delay some architectural scheme for a separate building at once attractive in appearance and convenient in its arrangement for classifying and exhibiting the objects. If such a building, and an appropriate site, were once determined on, it would probably be easier to get subscriptions from those who can afford to subscribe on a large scale. People require to have a definite object before them, and to know what is going to be done, before they will open their purses very liberally, even in better times than the present. We may perhaps have a suggestion to make just now about a site and about the form such a building might most suitably take. At present

we will only say that, both being essentially a matter connected with cheerful and bright associations, the building devoted to illustrating its conditions should also be bright and attractive in appearance,—the rather so as there is unfortunately too much reason for a prevalent feeling that "sanitary" places (and even in some cases "sanitary" persons) are by no means very bright or attractive in themselves, as far as we have yet gone. Sanitary books are made very dull, sanitary institutions very ugly, and sanitary inspectors—but, however, we must avoid remarks which might be translated by malicious people into personalities. In addition to architectural attractiveness, the proposed building might be made a practical illustration, externally as well as internally, of the materials and construction most fitted for promoting healthy conditions in crowded houses. It would be a small building comparatively to begin with, very likely, but it ought to be readily capable of extension, for we anticipate a large future, at all events, for the Parkes Museum of Hygiene. It concerns all, and appeals to all.

A FOREIGN ARCHÆOLOGICAL WORK.

IN these pages we have more than once had occasion to quote from our Parisian contemporary, the *Revue des Deux Mondes*, the archæological articles of Gaston Boissier. For many years the distinguished Academician has contributed to that solid publication a number of invaluable papers, the result of his studies and travels south of the Alps; and now he has gathered these communications together, and formed them into an octavo volume, which will be read, we do not doubt, by all interested in the artistic and classic history of Italy.* M. Gaston Boissier's work is of additional value, as laying before his readers the most recent discoveries and theories relative to the spots visited and described by him up to the close of 1879. Indeed, in his preface the author modestly expresses his fear that this very fact will soon render his work of but little interest when future research will have placed us more in possession of a knowledge of the life, the aspects, and the habits of the cities and people of antique days. This fear is, however, little founded when, on opening the book, one finds so much information that can never lose its interest or novelty, and described in that bright and inviting style which, familiar to all foreign archæologists, is additionally remarkable in M. Boissier, who is not professionally an archæologist, but an esteemed professor of Latin poetry at the Collège de France. Exceptionally familiar with the Roman society of antiquity, M. Boissier by necessity is an archæologist, to whom every inscription, every scrap of bedimmed but still glowing wall-painting, every old stone and lizard-haunted ruin, speaks of the life of the Romans of the past, our intellectual ancestors. With M. Boissier the absorbing and special studies of the pure archæologist have not exercised their usual influence. He mingles with his learning the rarely-met charm of literary skill.

On this very point, the want with the pupils of the Villa Medici in their architectural restorations of the supporting evidence of the literary sources of information, in addition to those afforded by artistic study, M. Boissier is warm. "The French Academy is not sufficiently impressed with the fact that the restoration of an antique monument, in addition to being elegant and agreeable to the eye, must also be exact, and it can alone be so if the architect who undertakes it has first studied the evidences and information left us by antiquity concerning the monument which he restores." Such advice cannot too constantly be held before the architectural student of every country, though of course it possesses more meaning (as regards Classic architecture) in France than in England, where our young architects do not, like our neighbours, commence their career by several years' residence in Rome and Athens, occupied in restoring (on paper, happily) the ruins of the great buildings of Greece and Italy.

This want of the literary respect that should surround everything that belongs to the distant past has led more than one archæological investigator to destroy work which, being of a later period than that specially interesting him, has prevented inquiry into the foundations or origin of the building explored. More than one interesting monument has been in this manner disfigured. M. Boissier in his work, does not make any special mention of the Coliseum, but the Coliseum offers an instance of this archæological zeal. As we remember describing in these columns some two years since, this interesting monument, so intimately bound up with the history of early Christianity, is now a water-filled swamp, in which the frogs weirdly croak at nightfall to the carefully scraped walls of the arenas, once picturesque in their verdure and beautiful with a *flora* the delight of botanising visitors to Rome.

How far this destructive warmth may be carried is curiously proved by a recent communication to the *République Française*, and from which it would appear that at Athens the archæological explorations have led to even sadder results; in the course of eager inquiries has been demolished the Frank Tower which stood at the eastern angle of the Acropolis, on the side towards the sea, and which masked neither the Parthenon, the Propylæa, nor the temple of the Wingless Victory,—an old tower the artists loved almost as dearly as the choicer marbles of Ictinus's Temple, for the mellow Attic sun had gilded it with the same glow as its more classic brethren in ruinous misfortune. Yet this simple tower, rising proudly on its base, marked a date in the history of Athens and the world, the Crusades, the feudalism of the West borne to the East, the Latin empire of Byzantium. But the old tower has been demolished as ruthlessly as if it had been but a shepherd's hut. When, asks Atticus, the writer to whose article reference has been made, when will come the turn of the Venetian ramparts and the Turkish bastions? There, on those fortifications, built by some unknown barbarian Vauban, the Phil-Hellenes of Fabrier have pointed their cannon; but the bastion is posterior to Pericles, and its days are numbered. One trembles at the thought that under the Parthenon as it stands lie the remains of the temple which the Persians destroyed, but the archæologist who will carry fully out the cruel work of Morosini will, we suppose, be immortal.

To such abuses a remedy can probably alone be found in admitting a greater share of influence to the literary student, who must direct and check the archæologist. The men of letters who are able to generalise on the discoveries made have it in their power to interest public opinion in the work of the archæologist, and to form, direct, and restrain that opinion by the sentiment of moderation with which they are imbued; this position renders the man of letters one of the most invaluable aids to the archæologist.

M. Boissier does not raise a voice against what may be termed, somewhat paradoxically, the vandalism of the archæologists. As he threads the now tidy Forum, with its railed-in precipices, unshadowed by the trees which only a few years ago adorned it so naturally, no regret is expressed for the memory of the Forum of Piranesi's time, the image of which the strangers of those days bore home from the honest old engraver and printseller's shop. The destruction of the Forum which Byron saw and described, has, it is true, shown us the Forum of Classic times; and if the picturesque drover from the marshes no longer passes through the old "foro," goading his meek-eyed bulls, we can more easily picture in imagination the Forum of imperial and republican Rome. To all this old life, so bound up in the memory of the Roman resident of thirty years ago, and which now has almost disappeared, M. Boissier devotes no regret; the utmost expression akin to such a feeling is to be found on the first page of his book, in which he refers to the new neighbourhoods rising in modern Rome on the not-so-long-since deserted tract that lies between Sta. Maria Maggiore and the Porta San Lorenzo. Even in the days of Nero, when that emperor rebuilt Rome, it would appear that there were not a few who regretted the disappearance of the narrow, crooked, old streets where cool shade was always to be found.

Much as one would desire to learn more of Herculaneum, in which we know are buried such treasures of art, Herculaneum remains still to be explored, buried under its liquid mud, which has hardened into a natural cement. All our knowledge of Pompeii's sister city remains obscure, like its streets and its temples; at Pompeii the sun shines again on the well-worn pavement of the Forum, and in the courtyards of the houses once so full of gaiety. M. Boissier is a delightful guide through the now silent streets of Pompeii, which reveal to him, from the various indications they afford, the life of the inhabitants, honest provincials, retired tradespeople, and humble artisans, of whom classic literature has left us but very few traces. This is one of the peculiar features of the existence at Pompeii which shows us a "bourgeoisie" living in the midst of a refinement unknown to their descendants of the present day; and which, when compared with the same feature of the existence of the Italian merchant-princes of the past, is eminently calculated to encourage the efforts of our so-called "middle-class" movement towards a high ideal of refinement and taste.

At Pompeii much remains still to be learnt of the life of the humbler portion of the population; most of the excavations have brought to light the interior of the houses of the more easy portion of the community, but the researches, which will next be continued on the side towards Castellamare, outside the neighbourhood that gathers round the road to Naples, will, it is expected, yield much information respecting the habits of the populace of Pompeii.

By the aid of the indications so far gathered, by the aid of various mural paintings and *graffiti* scratched on the walls of the shops so far unearthed, M. Boissier very skilfully revives the popular life of the City of Ashes. The Pompeians seem to have possessed, like their descendants the Neapolitans, an inexhaustible fund of gaiety, and again, like them, they encouraged a busy crowd of street-sellers, or *forenses*, vending a variety of wares, such as can almost exactly be found in the *piazze* of modern Naples, the different cries which Seneca speaks of as peculiar to his time being only changed in language. As a city of pleasure, Pompeii was amply supplied with wine-shops and hostelries, frequented largely by the smaller people; already we observe the pleasures of home supplied by the companionship of the "bar," which can here be exactly seen, its sole difference from the counterpart of to-day consisting in its being of marble. There are the holes for the various bottles, while for the market people and those who have no time to linger, the "bar" is placed outside in the street. Nor is accommodation wanting for those who may desire to pass their time happily; and the wall-paintings discovered represent the interior of these hostelries as being places "that isn't what they ough' to," as Birdofredom Sawin would say.

Traces are found in the inns of the passage of more than one traveller who has scratched on the walls the customary visitors' remarks.

These *graffiti* are by no means the least interesting of the many relics of the life of Pompeii, as among those which have been preserved have been found many curious details; one amusing inscription being a washing account; but invocations to love,—Venus was the patroness of the city,—occur the most frequently. Such inscriptions took the place, in Classic times, of the printed notices of to-day, and the play-bills of Pompeii have been thus preserved for us, side by side with the characteristic notice of apartments to let for the kalends of July, or a reward offered for a stolen or lost object.

From the gaiety of Pompeii we follow M. Boissier to the more sombre ruins of Hadrian's Villa, where will be found a marked contrast in the sober life there led in the days of its splendour. In his description of the long-since deserted port of Ostia, M. Boissier recalls the ever-interesting and mystic memories of the early struggles of Christianity, a study continued in the paragraphs devoted to Pozzuoli.

In his visit to the catacombs M. Boissier is accompanied as guide by the Cav. di Rossi, whose profound acquaintance with subterranean Rome is well known. The origin of the catacombs, the work of the Christians, their first existence as private property and under the protection of the civil law, occupy a chapter which will be read with interest by not a few. It would be difficult to say which portion of M. Boissier's work succeeds most in captivating the attention. All are almost equally interesting, described as they are in that style so familiar to the French literary and archæological student, and so agreeably free from the tone of pedantry and specialism that leads such works, when published in our country, to be read alone by a privileged few. When it is stated that the work is published in the same form, and at the same price as the most recent romance,—that is,

* Promenades Archæologiques. Rome et Pompéi. Par Gaston Boissier.

let it be recalled to readers in the habit of paying their 30s. for a three-volume novel, at little more than 2s.,—it will be seen that the publishers have no fear that the work will be alone read by a few would-be Dryasdusts.

It is much to be desired that the tone to be met with in such works on the Continent were more widely introduced into England. Art and archæology are not looked upon as special subjects, interesting only to a small number of professional men and their friends. Without losing its dignity, archæology is more popularised through the elegant diction and vivacity of relation of its professors; and hence their writings find a far larger public than such books do either in England or America.

BRISTOL AND GLOUCESTERSHIRE ARCHÆOLOGICAL SOCIETY.

THE fifth annual meeting of this Society was held last week in Stroud.

On the first day (Wednesday, the 21st) a meeting was held in the Subscription Rooms, when the President of the Local Committee (Mr. Caruthers Little) formally welcomed the members to the town and neighbourhood of Stroud, and Sir William Guise, president of the Council, having responded, took the chair, and called on Mr. P. Hallett, the general secretary, to read the annual report, which stated that the year's returns show 494 subscribing members. The income, including last year's balance, was 514*l.* 12*s.* 11*d.*; the expenditure, 312*l.* 1*s.* 6*d.*; and the balance, 202*l.* 12*s.* 5*d.* Besides this, the Society has 414*l.* 15*s.* in Consols, representing the composition fees of life members, to which sum the life subscriptions above mentioned will be added. Having acknowledged the presentation of various works and the gift of a picture of St. Briavel's Castle, by Mr. C. J. Thomas, for the intended museum, the report proceeded:—

"To this subject of the museum the Council is desirous at the present time of calling special and particular attention. The Society is now completing its first lustrum, and during this period it has done much that may be fairly viewed with satisfaction. Since its first year it has annually maintained, without special effort, a list of about 500 subscribing members. Its finances have continued sound, and instead of the common luxury of a funded debt, it has been able to achieve the less common luxury of a funded reserve. . . . . There is not only an entire absence of any museum of antiquities in the county belonging to the Society, but there is nothing in its possession that can fairly be called the commencement of such a museum, and in this important respect the Society compares most unfavourably with its neighbours. The end of each lustral period, in the days of antiquity, was a time of sacrificial purification, and the Council hopes that it will be only needful for the society to become conscious of this fault in its system in order to make this present fifth year of its existence a true lustrum in the ancient sense. Money can do something towards the work of expurgation, but money cannot do all, or nearly all. If a museum of antiquities in general can be purchased in the open market, a museum of Bristol and Gloucestershire antiquities is not to be thus acquired. Such a museum cannot be suddenly made; it must grow. It must be the result of numberless increments of addition and adaptation. It can only be a work of time, but there is a time when the work ought to begin. . . . . 'The establishment of a museum or museums' was laid down in the Society's original prospectus as one of the objects of its foundation. As stated in last year's report, the Council, after much consultation and inquiry, has determined upon the establishment of two centres for museum purposes, the one at Bristol, the other at Gloucester, with the condition, however, to donors, of absolute liberty of choice between them, and with the hope that this liberty will be largely exercised. . . . . In regard to the formal affairs of the Society, the Council has only the customary changes to report or to recommend. In the exercise of its duty of annual nomination of officers, it desires to nominate for re-election the president of the Council, the vice-presidents, and the secretaries, general, sectional, and local, at present in office. The following members of Council retire this year by rotation:—Messrs. Leigh, Kerslake, Blunt, Lucy, Swayne, Gael, and Baker. The nomination of their successors rests with the members of the annual meeting. The Council, during the year, has held six meetings, three at Bristol, two at Gloucester, and one at Stroud, and desires to express its acknowledgments to his Worship the Mayor of Gloucester, and to the authorities of the Museum and Library at Bristol, for the accommodation afforded to it at Bristol and Gloucester respectively, and also to the Cotswold Field Club for the friendly hospitality shown towards it, and through it to the Society at Stroud."

On the motion of Baron de Ferrieres, seconded by Mr. W. Leigh, of Woodchester, the report was adopted; and on the motion of Mr. Little, seconded by Mr. C. Bowley, the several members of the council were elected.

Sir William Guise proposed a vote of thanks to the retiring president, Mr. Gambier Parry, and introduced the president-elect, Mr. J. E. Dorington, in Mr. Parry's unavoidable absence.

The President delivered an address, in which he said the question might be asked, was not the archæologist too frequently attached to the investigation of very old times, and did he not neglect to hunt up and preserve the remembrance of relics of periods which, though only just passed away, would never recur again? Flourishing and thriving as that neighbourhood had been for many centuries, it was scarcely possible to conceive the state of the roads in the beginning of the present century. Such excursions as they proposed to make during the next two days would have been absolutely impossible on wheels a couple of centuries ago. In 1795 the road to Nailsworth was made, and, to show the state of the soil before then, if a spade had been stuck in the ground there at night it would have disappeared by sinking in the next morning, which demonstrated the state of the roads then. What had the English race been doing since the Romans maintained on their hills structures such as the Roman villa at Woodchester, not inferior to the most splendid residences now existing in the county? Roman war-chariots could not have been driven along the mountain-tracks which served their ancestors as roads two generations ago, and only during the last century had the English race developed any talent for building structures other than ecclesiastical and military.

After the proceedings in the Subscription Rooms were brought to a termination, the members and associates had an excursion, the first halting-place being Bownham House, where Mr. Lancaster entertained the party at luncheon. Afterwards a visit was paid to Rodborough and Minchinhampton commons, where the remains of pit-dwellings and the encampment were inspected. Then the party went to Minchinhampton Church.

An evening meeting was held in the Subscription Rooms at Stroud, when

Mr. C. Wethered read a paper on "The Domestic Architecture of the District," in the course of which he said:—It is true this immediate neighbourhood can boast of no mighty achievement of the past recorded in the lofty language of stone, no baronial halls rich in historical associations like the castles of Berkeley and Sudeley, but it possesses an invaluable work of art in that splendid remnant of an extinct civilisation, the Greco-Roman pavement at Woodchester. . . . . Let us pass at one leap to an epoch more than a thousand years further down the stream of history. In "the spacious times of great Elizabeth" there was no fairer portion of what was styled of yore "Merry England" than this. The manor-house and other abodes of similar grade, with their bays and oriels, "bosomed high in tufted trees," hamlet and homestead, extending far and wide on hillside, in vale and in combe, all nestling in their rural surroundings, formed one harmonious combination of the works of nature and of man. New comers into this neighbourhood could hardly be more impressed by the long sweep of the valleys and the flowing outlines of the hills than by that strong element of the picturesque lent to the landscape by our local domestic architecture. It conveys the same sentiment of human interest to Cotswold scenery as the wooden châlets impart to Swiss mountains. And even in these scientific days, there are not a few who willingly turn from contemplating the terrible processes of nature in the geological upheavals and subsidences on every side of us to read tales in stone that tell of men's past lives and labours. I am not taking account of erections of later years, so devoid as a rule of all real expression. I am referring to the remaining examples of that old Northern Gothic, which, if not wholly indigenous, took deep root in our soil, and flourished here for many generations, until, in fact, it was stifled by the disturbing influence of pseudo-Classical prejudice. The hand-weaving of woollen cloths, long the staple industry of this locality, is an inheritance from the same source as that to which Sheffield owes its reputation for cutlery. A strong Flemish feeling is also discernible in numerous carved oaken chests, chairs, and tables still existing among us, or scattered elsewhere. These household adornments display a much higher excellence of handicraftsmanship than what we see in articles of the like kind made to meet the demands of modern fashion. Owing mainly to the skill of our local masons and their seclusion from the chief centres of innovation, together with the excellent quality of the freestone, its traditions lingered much longer in the Gloucestershire valleys than elsewhere. Stroud possesses an object of antiquarian interest in its Townhall, dating, in the opinion of a distinguished authority—Mr. Parker, of Oxford—from the fifteenth century. Stripped of its recent additions, from an architectural point of view it is worthier of notice than the costly modern building of greater pretensions close by. It has scale and proportion, with a quiet dignity of its own. As especially domestic types of illustration I may take More Hall, near Randwick, said to have been founded by a nephew of the celebrated Sir Thomas More, and the Court House at Painswick. These are, in reality, nothing more than a grouping and blending on a wider scale to meet larger wants of the elements to be found in every adjacent cottage of the same date; bringing every tenement, however humble, into a kind of masonic relationship with the rest. Much of their attractiveness depends on the mode of fenestration, and on the steep declivity of their roofs; the windows being either a single opening, with boldly-chamfered framing, or of two or more lights divided by mullions, and frequently crossed by transomes. The dripstone above is still more effective when carried round as a string-course, by defining a height and marking a flooring, while it adds in its long line of shadow a frown to the front. The roof, the crowning of the edifice and the symbol of home, is always conspicuous from its size and pitch, having an angle of inclination seldom less than 60 degrees. Broken up into many gables, it imparts variety to the skyline and increases the play of light and shadow. Above all rise the bold stone chimney-heads, worked in the solid and often set on the diagonal, putting to shame those flimsy pot-and-pan cylinders stuck on yesterday and apt to be blown down to-day. Unity of local means and appliances is further preserved by roofing with stone tiles, a natural formation principally occurring, I believe, in the oolitic beds of Tetbury. From long exposure to the weather, the outer surfaces have acquired a tone of the warmest grey, softened by Nature's own touches of colour in moss and lichen. Many possess either a projecting or recessed porch, affording shelter, and suggesting the sentiment of rest. The Cotswold masons have left upon their hatched and chiselled stones that impress and strength of endeavour which clearly shows in lasting marks how "joy's soul lies in the doing." Much of what they built has been destroyed or defaced by the meddlesome hand of the spoiler, moved by that spirit of unrest which is one of the besetting sins of modern life. An arrest of continuity in the vernacular architecture of a people or race dulls and checks the æsthetic yearnings of the craftsman. Such an arrest occurred, though later here than elsewhere, as I have just said, when the blight of the Classic Renaissance swept over France and England. A century or more ago it led to the transformation of Stratford House, The Field, Steanbridge House, and many another neighbouring "haunt of ancient peace," into the state in which we now see them. Every one of their monotonous façades, with the inevitable portico, and windows of the same deadness of shape, size, and number on each side, is the borrowed dress for forms that were then ruthlessly disarrayed. Men then did their utmost to blot out the nobler features of the dwelling-houses in which their forefathers had lived and died. After all, archæology is but the registry and classification of material facts of the past, unless we can apply some of its teachings to the formation of a system of instruction which shall bear fruit in the arts of the future. Amid the confusions arising from the neglect of ancient principles in the industrial arts, it is cheering to find traces of true Gothic feeling in the productions of the stonemasons, carpenters, and smiths of the present day. We have followers of these honourable crafts in Stroud, who can read drawings and render results in a way quite worthy of their ancestors.

Mr. C. Playne followed with a paper on "Stroud Houses." He said the oldest building which he had found in that neighbourhood was a granary near the residence of their president (Mr. Dorington), and the oldest dwelling-place was Dennay, in the parish of Bisley, close to the Thames and Severn Canal. The next oldest was More Hall, near Stroud, and then came the Court House at Painswick, where Charles rested after his repulse at Gloucester. Next in point of age was the interesting old manor-house of Owlpen. One place deserving attention was Bradley, and as it was stated Shakspeare once lived at Dursley, not far from it, the place had been suggested as that the dramatist had in view as the residence of the worthy Justice Shallow. He came to the conclusion that they had in those old houses remains far more pleasing to the eye than most of those built at a sub-

sequent period. He recommended those who might build houses to put their initials on them and the date for the benefit of archæologists who might come 400 years hence.

A discussion took place relative to the old buildings in that part of Gloucestershire. The Rev. T. Keble called attention to the old manor-house at Bisley as one of the most interesting in the neighbourhood, and one of the most ancient, dating from the time of Edward IV. It belonged to Queen Elizabeth, and he believed she slept there on the occasion of her visit to Frocester. The President said that rather conflicted with a tradition that it was a house two miles distant, though he thought the probability was in favour of this house.

Mr. C. Playne subsequently read a paper on the "History of the Cloth Trade," which, he said, was a subject that could not well be omitted at such a gathering in the metropolis of the cloth manufacture. Having given some particulars relating to the early records of the mystery of cloth-making, in which he alluded, *en passant*, to the efforts of Thomas Blanket, who set up looms in Bristol, he went on to speak of the statute of staples or fairs passed in 1357, by which wool was enacted to be sold at ten towns in England, of which Bristol was one. The devices practised by wool-merchants were alluded to, one writer saying that they concealed their right of knowledge by well-studied fraud. In the seventeenth century it was provided by law that all bodies buried should have woollen shrouds, in order to protect the trade, and the clergyman had to certify that a corpse buried was shrouded in wool. Leaving the general history of the trade, the reader spoke of the local history, and the rise of the manufacture in the district of Stroud. Since the reign of Elizabeth cloth was made at Minchinhampton, and Fuller spoke of the excellence of the streams at Stroud for the manufacture, and the advantage of the Cotswold Hills for the growth of woollen sheep. From 1800 to 1824 was the most prosperous time in Gloucestershire for the cloth trade.

The Rev. R. N. Clutterbuck followed with a paper on "Clothiers' Troubles," and

Canon Scarth read a paper on "The Staunton Font," Sir John Maclean making a few remarks on the same subject.

Dr. Bird next read a paper on the ancient races of the Cotswold Hills, in which he narrated the result of an investigation of barrows that had been opened. He said around Stroud they had many instances of the practice of cremation, and where they found that they might be sure there were traces of the Assyrian immigration.

On Thursday, the 22nd, a party of more than 200 ladies and gentlemen started at ten o'clock in breaks, &c., to view the Roman pavement at Woodchester. A section of the pavement had been opened, and this was examined with great interest, and a paper on the subject was read by Mr. J. D. T. Niblett. This Roman mosaic pavement was discovered in 1695. The last time it was opened was in 1853. In 1793 the whole design was discovered, and appeared to be the remains of a Roman mansion. When this building was erected cannot be ascertained; but Roman generals erected public works in the neighbourhood in the reign of Claudius, A.D. 61. The clearance recently effected has been due to the exertions of the Rev. F. Smith, the newly-appointed rector of Woodchester, aided by a small grant from the Bristol and Gloucestershire Archæological Society. No perfect idea of the beauty and interest of the pavements can be conveyed in print; but, according to present arrangements, the pavement will remain open for public inspection until the 5th prox., after which it is proposed to re-cover it again with earth; but it is hoped that funds may be forthcoming to erect a protecting building to ensure its being always open for public inspection.

The party then passed on to Owlpen House, the residence of Mr. T. A. Stoughton, where they found luncheon awaiting them. Here, during a heavy storm, Mr. E. Witchell read a paper on Flint Implements. A tumulus at Uley Bury was afterwards visited and examined, and the party proceeded to Selsley Hill, where a large number of remains of pit-dwellings are to be seen, and the Rev. A. S. Page, the vicar, read a paper on the subject.

In the evening a *conversazione* was held in the Subscriptions-rooms at Stroud, when the museum formed a subject of much interest. The first paper read was on the history of the parish of Bisley, by the Rev. W. H. Lowder, who restored Bisley Church a few years ago. He gave an interesting account of the early history of the parish. A paper by Mr. Middleton, on Leonard Stanley Church, showing that it was an old college of canons, was read by the Rev. W. Bazeley. Mr. Bazeley also read a paper on "The Berkeleys of Leonard Stanley." Mr. C. Playne showed a drawing of Frocester barn, of which he gave some account. The last paper was on "The Great Orphan Will Book, Bristol," by the Rev. T. P. Watley, from which some extracts were read by Sir John Maclean. Mr. Powell, Q.C., also contributed a paper on "The Murder of Edward II.," but this was taken as read. It may be remembered that two years ago M. Germain, a French *savant*, found in the archives of Hérault a copy of a letter purporting to have been written by Manueli Fieschi, Papal notary at Avignon, to Edward III., the substance of which is that Edward II., upon being told that Gurney and others were coming to kill him, escaped from Berkeley Castle by killing the porter; that the knights put the corpse of the porter into a coffin and buried it, as if it had been the body of the king; and that the king escaped to an Italian hermitage, where he remained in strict seclusion until his death, ten years after his escape from Berkeley. This letter was published in full in *Macmillan's Magazine*. Mr. Powell has arrived at this conclusion: "On the whole it seems to me, speaking in professional terms, that those who contend that the king was not murdered have made out a sufficient case to go to the jury, and as you occupy that position to-night, I leave the question for your determination."

On Friday, the 23rd, the concluding meeting of the Society was held in Stroud, when Sir John Maclean proposed, and Mr. Leigh seconded, that next year's meeting be held at Chepstow, and this was unanimously carried.

Sir William Guise moved, "That it is desirable to preserve the Woodchester pavement *in situ*, and that the Council be instructed to take steps to secure that object." Dr. Paine seconded this, and it was carried.

Votes of thanks were passed to all who had assisted the society with contributions and personal help.

A large number of the members afterwards proceeded to Painswick, where they visited the site of the old camp, and then inspected the Court House, an ancient dwelling. Next they went to Cranham, where they were entertained to lunch by the president, after which a tumulus was opened in a field occupied by Mr. Dancer, and some exceedingly interesting remains discovered. Thence the party proceeded to Bisley, and under the guidance of the Rev. W. H. Lowder examined the church and other objects of interest. Next they visited Lypiatt Park, the residence of the president, and said to be the house where the Gunpowder Plot was hatched; several points of interest between there and Stroud were examined on the return journey. The meeting has been favoured with fine weather with very slight exception, and has been thoroughly successful.

NEW WORKSHOPS OF THE LONDON, TILBURY, AND SOUTHEND RAILWAY.

FIVE years since, when a lease of the above line expired, and the company took it into their own hands, they did not own a single locomotive, or carriage, or wagon. Since that time the company have acquired all the locomotive power and rolling stock necessary for the working of their large and constantly-increasing traffic. They have, in addition, completed a fully-equipped railway factory at Plaistow, for making and repairing their engines and rolling stock.

In laying out the works, Mr. A. L. Stride, the company's manager and engineer, was under serious difficulties from the absolute limits within which he had to erect his buildings; his boundaries were, to the west the main sewer of the metropolitan system, which crosses over the line, and on the east the highway, which also crosses over the railway. The fan-shaped piece of land, about three acres in extent, that was available has been turned to excellent account. The south side of the land has the Plaistow station and platform, then the lines of the Tilbury and Southend Railway; next, a central double platform on which are six covered waiting places with seats; beyond that are the two lines of the North London Railway, and outside of them the boundary that incloses the new buildings and sidings.

The principal buildings, accommodated to the shape of the ground, are in two main blocks, each with three gables, the central gables rising above the wings. The building materials are white and red brick, the surfaces relieved with rusticated pilasters at the corners and between the bays.

The building nearest the line is 207 ft. long, and is divided into three divisions, each 41 ft. wide. It has a side elevation of seventeen bays, the windows being 8 ft. 3 in. by 6 ft. 9 in. The first division in this building is a running shed, with room to accommodate eight locomotives. The second division is an erecting shop, with an overhead traveller running upon oak beams, 13 in. square, resting on strong corbels. The third division has, to the front, a machine-tool and fitting shop, 97 ft. long, with shafting and belting all through, and furnished with lathes, planing, boring, slotting, shaping, and other machines. Adjoining this is a smithy, 56 ft. long; it has fifteen fires blown by a fan, and has in the middle of the floor a half-ton stroke steam-hammer. The remainder of this division is appropriated to the coppersmiths' shop, 24 ft. 6 in. long. Each of the three shops last named is 42 ft. wide. Power to drive the machine tools will be supplied by a vertical engine of 9-horse power, by Craven, of Manchester. The boiler-house, and a handsome octagonal chimney-shaft, 70 ft. high, are separate, but in close proximity to the fitting-shop.

The second principal building, externally a counterpart of the other, is also divided longitudinally into three, but with wide arched openings in the walls. It is 168 ft. long, and gives three carriage and wagon shops, each 41 ft. wide, and served by two lines of rails in each division.

The roofs have light, well-braced and tied principals of wrought-iron. They are boarded, and covered with Welsh slates. Each of the six bays of roofing has a wide belt, glazed on the system introduced by Mr. Edgcumbe Rendle, of Westminster. Mr. Stride reports of the glazing that under severe trial it has proved abundantly strong, and quite impervious to rain and wind.

Between the two principal buildings, near the front, a 42 ft. turntable has been laid down, in the rear of which is a tall, strongly-built structure, for stores in the ground-floor portion, and on the top a water-tank with a capacity for 25,000 gallons. The tank has two divisions, one to contain the water drawn by the company from their own ground, the other to take the water supplied by the East London Waterworks Company.

The only remaining building calling for notice is a detached block providing light and convenient offices and rooms for manager, draughtsmen, clerks, and others connected with the works.

The line is worked on the absolute block system, and an important item in the new works at Plaistow is a signal cabin with twenty-eight levers, embracing the latest improvements for points and signals, and in electrical distance-signal repeaters.

MONUMENT TO MERCATOR, DUISBURG.

OUR readers will remember from their school-days (although most of them may have carried it about with them as an unsolved riddle) what they have read on one of the first leaves of their atlas, "Map of the World after Mercator's Projection." These words indicate the eminent services rendered by a great man. But although this has been done since atlases were first introduced; although the name of the inventor has been handed down from generation to generation, and not in works hidden away, but plainly before all eyes; although, besides, his invention is used by thousands day after day,—notwithstanding all these facts, the man had been almost wholly forgotten; familiarity with his life and his fortunes had been almost entirely lost; his deserts were awarded, even with the consent of his German countrymen, to foreigners; and he himself, when attention was again drawn to the importance of the services he had rendered to geographical science, was claimed by a foreign nation.

In presence of such a state of things, the unveiling of a statue of Mercator in the course of last year at Duisburg on the Rhine, by which has been paid a debt of honour long owing to

a great man, is of especial significance. By this act, the German nation has come to its own.

Gerhard Kremer, called Mercator, was born on March 5, 1512. His parents lived in the duchy of Jülich, probably at Gangelt (district of Aachen), and there young Gerhard dwelt until his sixteenth year, and had his education. But he was born in Rupelmonde (Belgium), where his parents happened to be on a visit to his father's brother, Gisbert, who was vicar there. On account of this accident, Rupelmonde has claimed Mercator as a Fleming, and even went the length of erecting, in 1869, a monument to him, as the "Beroemden Wasenaar." Yet he himself, in the "Fabula Galliae et Germaniae" (1585), in the dedication to Duke Johann Wilhelm, of Jülich-Cleve, set the matter at rest. The Flemings, as we shall see presently, can scarcely think of him without a certain sense of shame.

Mercator went to the University of Louvain in 1530, and he continued there also after he had become baccalaureate. He at first devoted himself diligently to humanistic studies, but changed suddenly to mathematics, especially mathematic geography. Besides cultivating the sciences, he practised, as customary at that time, mechanical work, making spheres, astrolabes, astronomical rings, &c., of brass. He soon began also to engrave maps, which met with much success; in 1541 he completed, after a labour of eighteen months, a larger piece of work, a globe, which he dedicated to the Imperial Chancellor Granvella. Through the latter he was introduced to the Emperor Charles V., and received from him,—who, it is well known, took great interest in mechanical art work,—various orders. He was so successful in such labours that his productions were looked upon in the sixteenth century as the best of their kind.

Although he had attained some eminence by his work, and was besides extremely peaceable and cautious, he fell a victim to the spirit of persecution of the time, and to the Inquisition. In 1544 his uncle Gisbert died. In order to arrange matters of inheritance, Mercator went to Rupelmonde; there he was denounced as a heretic, and thrown into prison. Notwithstanding all machinations, no cause for prosecution could be discovered, and after more than three months of severe imprisonment he was set at liberty. For this favourable result he was more especially indebted, saying nothing of his own caution (he had never publicly and openly seceded from the old church), to the exertions of the University of Louvain, which, by liberating one of its members, was anxious to preserve intact its own privileges; and it may be in consequence of this issue that Mercator stayed on in Louvain a few years longer. How serious the matter was, however, may be inferred from the fact that, of his fellow-accused, two were burnt, one was beheaded, and two (women) were buried alive.

Residence in Belgium becoming more and more unsafe, and religious persecution more violent, Mercator at last left the country with his wife and six children, and took up his residence in Duisburg, formerly a free town of the German Empire, but mortgaged for several centuries to Cleve, yet at that time still enjoying great privileges. We may assume that Mercator, like other eminent men of that period, was induced to choose the duchy of Cleve as his place of residence on account of the religious liberty prevailing there. The sciences were especially cultivated, and there was also a scheme on foot for establishing a university, the required privileges having been already granted by the Emperor and the Pope; but the plan was not carried out until a hundred years later, during the reign of the Great Elector of Bradenburg, when the duchy of Cleve had been acquired by the latter. As a preliminary step to the university, the magistrate of Duisburg established in 1559 a gymnasium. Mercator took a very active part in its foundation. For several years he taught at the school, but he was ultimately obliged by increasing work to discontinue his teaching. He remained, however, in the town until his death, which took place on December 2, 1594,—an esteemed citizen. His descendants continued to reside there, occupying an honourable position. On that account the town is looked upon in Germany, and rightly, as the second home of the family, voluntarily chosen by them.

While still in Louvain, Mercator made the first discovery which handed down his name to posterity. This was the establishment of the deviation of the magnetic needle, its cause, and the position of the magnetic pole. He mentions this fact in a letter written to Cardinal Granvella, the celebrated minister of Charles V. and Phillip II., one of the most accomplished diplomatists of his time. That letter was discovered and first published by Dr. Breusing.

The deviation of the magnetic needle had been noticed by Columbus, but its existence was not definitively established until the close of the next century, by Mercator. This service rendered to geographical science has hitherto been ascribed to a Spaniard, Martin Cortes, who speaks in his "Art of Navigation," published in 1555 at Seville, of the magnetic points of attraction on the earth's surface. It is supposed that Cortes obtained a knowledge of Mercator's discovery through Granvella or Charles V.

The second work of Mercator's which created a sensation belongs to the year 1569. In August of that year he completed his great map of the world for the use of navigators. From it dates the reform of cartography, which latter has to record no work of like importance, and with it a new epoch in navigation began. This discovery was equalled in significance only by two others in navigation, the ship's compass and the sextant. The work of Mercator possesses the rare advantage of combining theory with a practical instruction for sailors. The directions contained in Mercator's "Sailing" are followed to the present day; only, as Breusing remarks, nearly all authors of sailing directions are using Mercator's rules without being aware of the fact that they give them almost verbally. Mercator's original method of projection was not the only one proceeding from him; a second, ascribed later to De l'Isle, and a third, attributed to Bonne, are in reality his. But even his most important work was claimed for another, for our countryman Wright, who thirty years later published some tables enabling everybody, even those possessing no mathematical knowledge, to construct charts. As late as 1805 a German described Wright as the "inventor of the true construction of the charts commonly called Mercator's." It was left to a Frenchman, D'Avezac, in a work published by him in 1863, to restore to the Germans the credit due to a German.

Not long after his second great work, Mercator planned the issue of atlases, intended for everyday use, but resting on exact information. He was forestalled in the execution by Abraham Oertel, likewise a German, who published in 1570 his "Theatrum Orbis Terrarum." But this work is founded partly upon Mercator's earlier maps, and was, moreover, greatly furthered by the disinterested assistance rendered by the latter. It has no claim to independent value.

Mercator continued to labour on his collection of maps and charts, notwithstanding former preliminary work, for another quarter of a century; and each map marks a step in advance in geographical science. At his death, in 1594, the work was not quite finished. His only surviving son completed it, and published it, along with the Cosmography of his father, in 1595, under the title chosen by the elder Mercator, "Atlas." The meaning of this designation is not quite clear, but apparently it has no reference to the supporter of the heavens. The excellence of the "Atlas" may be surmised from the fact that a few years after its first appearance all rival works had disappeared.

Apart from the publications mentioned, which have ensured to his name an undying memory, Mercator issued a large number of others, which created a sensation at the time, but which we need not mention here. This much is certain, that the effect of his works has continued to make itself felt up to our time, and that the most important were matured in Duisburg, which he had selected as the sphere of his activity, and which on that account was bound to renew and perpetuate his memory. As early as March, 1869, therefore, a committee was formed at the invitation of Dr. Breusing for erecting a monument to Mercator in Duisburg. In Rupelmonde a similar movement had been started three years earlier. Moreover, a biography of Mercator was published there, in 1869, by Dr. van Raemdonck, a Belgian, to which Professor Köhnen, of Duisburg, contributed valuable information, derived from local archives. The idea met with general approval; some 600*l.* was subscribed, and the foundation-stone was laid in August, 1869. But the Franco-German War diverted attention, and public interest was not aroused again until the town architect, Herr Schülke, took up the matter again energetically. He drew up the plan, towards the execution of which the Art-Union of Düsseldorf contributed a considerable sum, the funds collected up to that time proving insufficient. The monument was entrusted to the sculptor Reiss, of Düsseldorf; the erection was undertaken by Herren Kaufhold & Berndt, of the same city; and on September 2nd of last year the unveiling took place on the Burgplatz.

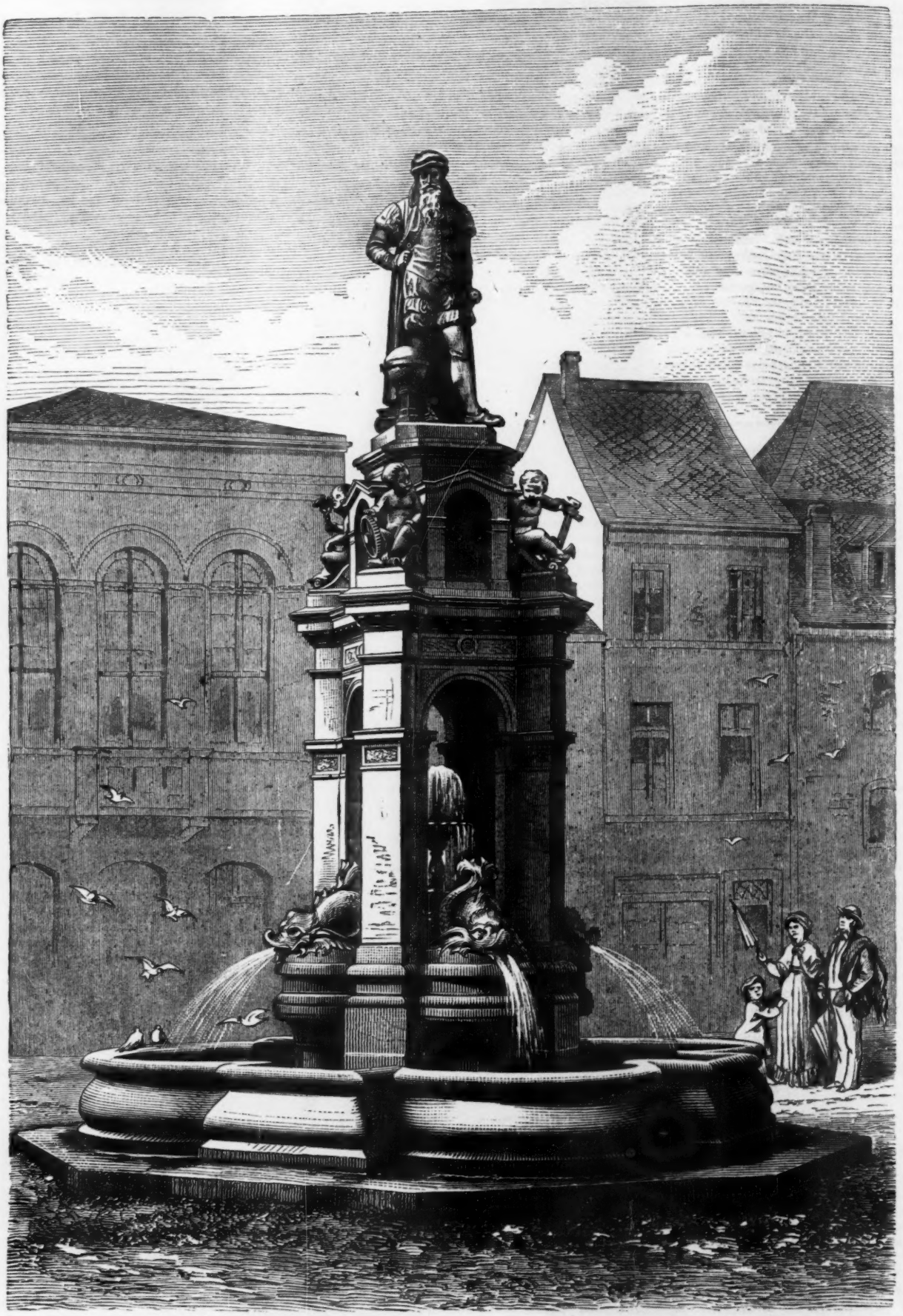
Mercator is represented in the dress of his time, as it is found also in some excellent busts of him; the cloak being carried down to the feet, in order to impart to the figure a quieter effect. The head is very noble, full of expression, and lifelike. The furrowed forehead, shaded by the baretta, the thoughtful face looking down upon the beholder below, the flowing beard, and curly hair impart to the portrait a venerable, yet manly character. The monument rises from a basin and has arched openings in the lower part, within which are water-spouts in the form of dolphins. At the upper part, at its four corners, are juvenile figures representative of Science and Navigation, Commerce and Industry. It is 28 ft. high, and in the style of the Renaissance of the time in which Mercator lived. The material is white Trier sandstone; the base being of basaltic lava, the basin of bronze. We present to our readers a faithful illustration of the monument.

THE SOCIETY OF ENGINEERS.

ON Wednesday, the 21st, a number of the members of the Society of Engineers visited the Signal Works of Messrs. Saxby & Farmer, in Canterbury-road, Kilburn. The party included Mr. Joseph Bernays, president of the Society; Messrs. Charles Horsley, J. Church, and P. F. Nursey, members of the Council; Mr. A. Williams, honorary secretary and treasurer, Mr. B. Reed, secretary; and others. Conducted by Mr. Farmer and by Mr. C. Hodgson, the manager of the works, they visited the museum attached to the works, in which are models of all the chief inventions in signals, locking and block, and interlocking-block signal apparatus, brought out by Messrs. Saxby & Farmer, from whose works have emanated some of the most important appliances for conducting safely the great traffic of modern railways. Here Mr. Farmer explained the model of the first arrangement patented in 1856 for connecting and interlocking points and signals, and by means of other models showed the development of the principle of signal control of all points, crossings, and level crossings, to the most recent arrangement by which not only may a train, the driver of which has disregarded a danger signal, be diverted into a clear line from which a goods train may have been shunted across his own main line, but by which, in case of necessity, a signalman at one station may set the signals of a distant signalman at danger, and hold them there in spite of that signalman. The apparatus thus procures absolute mechanical interlocking, by which any trains or obstructions may be covered. Every possible contingency seems to be provided for. These arrangements are gradually coming into use, though more rapidly in Belgium than in this country. The society afterwards dined together at the Guildhall Tavern, Gresham-street.

Royal Dramatic College.—At the Auction Mart, Messrs. Farebrother, Lye, & Palmer have made another unsuccessful attempt to dispose of the Royal Dramatic College, which is situate at Maybury, near Woking, Surrey. The foundation-stone of the great hall was laid by the late Prince Consort, and the building was inaugurated by the Prince of Wales. The sale was by direction of the trustees (Lord William Lennox and Messrs. Benjamin Webster and Anson) under an order from the Charity Commissioners. There are five pensioners in the building at the present time. The pleasure-gardens and grounds surrounding the building extend over ten acres, and the whole is opposite the South-Western Railway, being about twenty-five miles from London. The estate was put up at 3,000*l.*, and reached by slow degrees 4,500*l.*, when the auctioneer intimated that he had instructions from the Charity Commissioners not to sell it under 5,000*l.*, private tenders being invited. It has been since stated that the building is sold, Mr. Alfred Chabot being the purchaser.

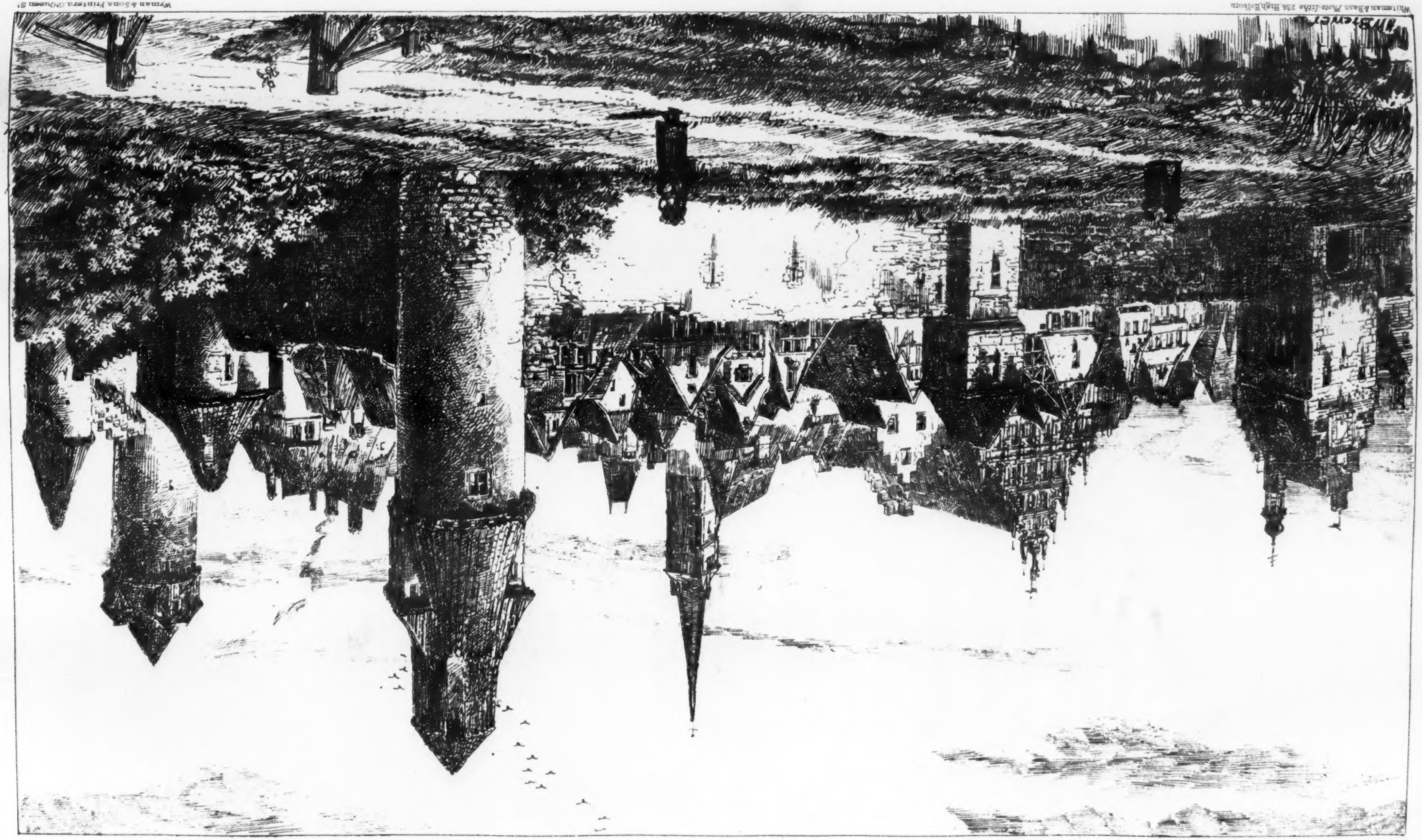
[illegible]



MONUMENT TO GERHARD KREMER, CALLED "MERCATOR," DUISBURG ON THE RHINE.

HERR REISS, DÜSSELDORF, SCULPTOR.

SULZFELD, GERMANY.



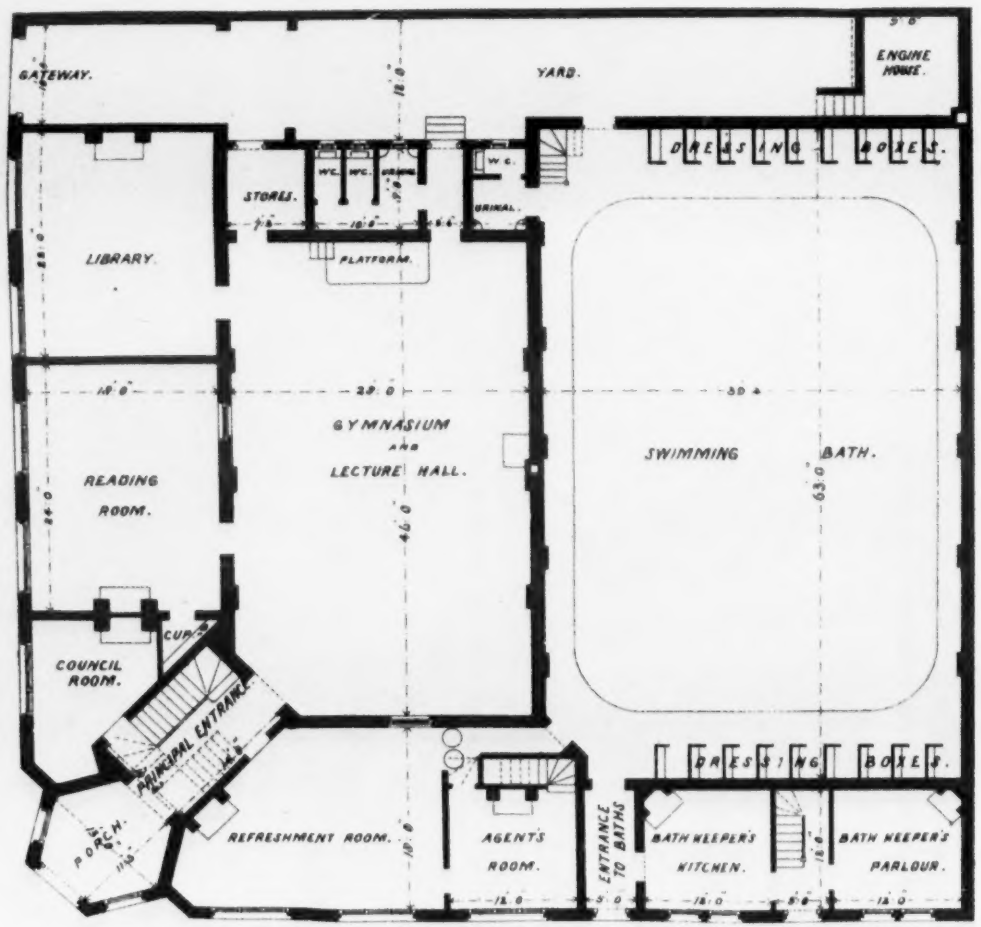
Wittmann & Baas, Photo-Litho, 256 High St., Boston.

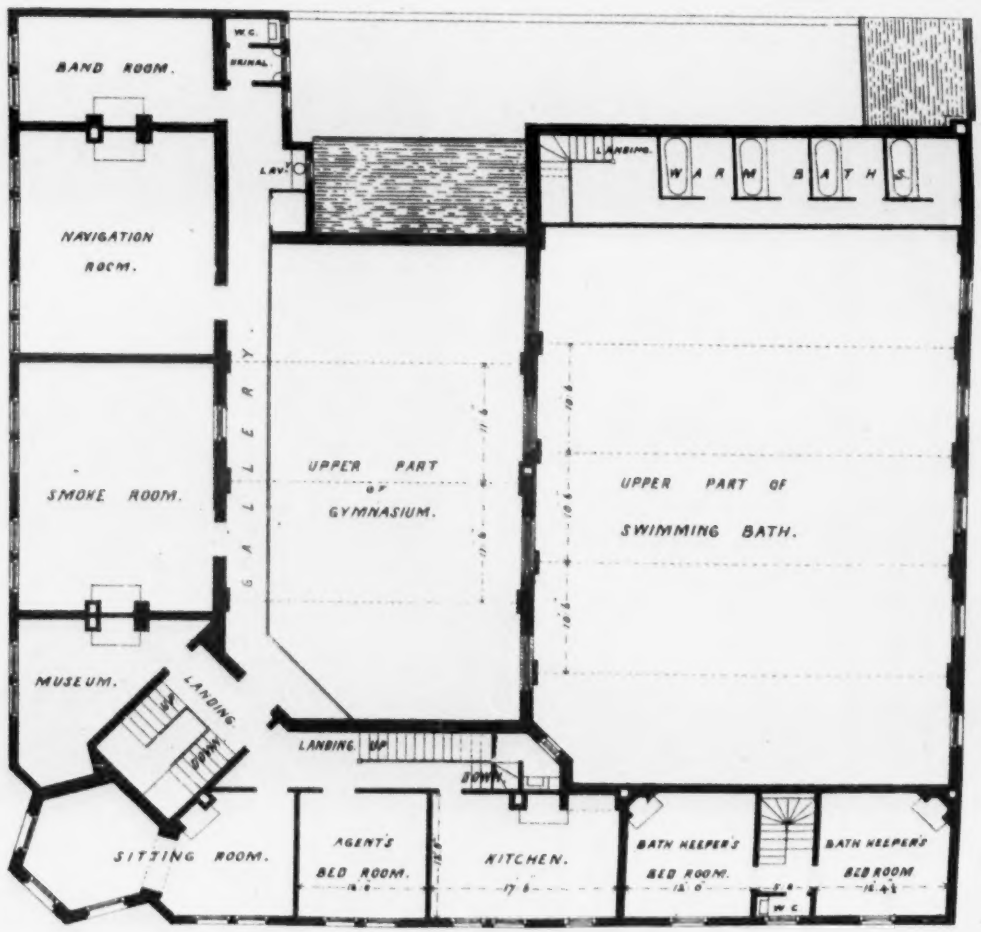
Werman & Sons, Printers, 20 Queen St.

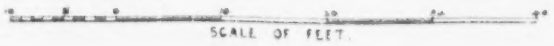
SULZFELD, GERMANY

Whiteman & Bass, Photo-Litho, 236 High Holborn. Wyman & Sons, Printers, 74 Queen St.

THE FISHER-LADS' INSTITUTE, GREAT GRIMSBY.—Mr. Charles Bell, Architect.



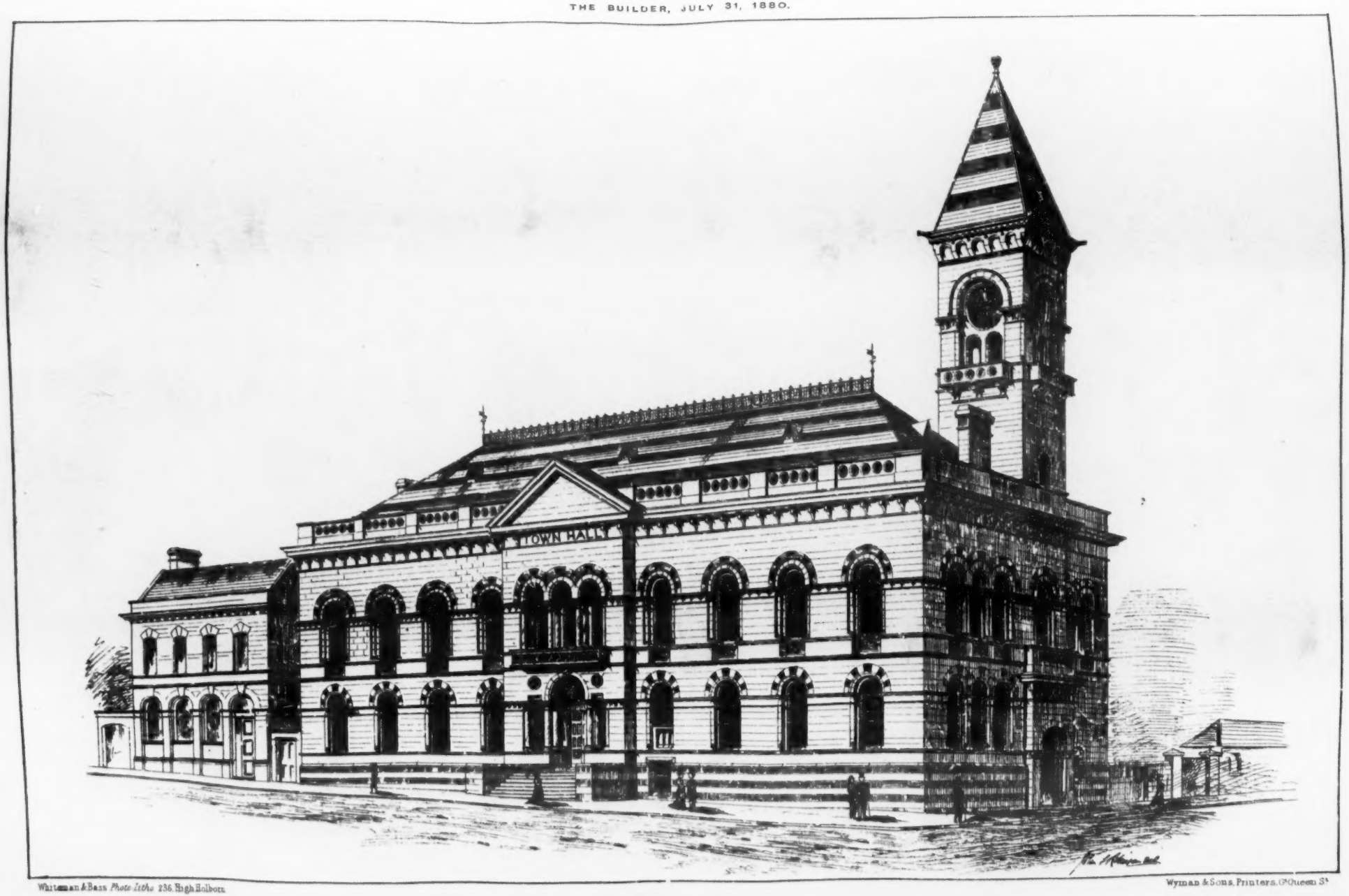




Whiteman & Bass Photo-Litho 236 High Holborn

Wyman & Sons, Printers, 74 Queen St

FISHER-LADS' INSTITUTE, GREAT GRIMSBY.



Whiteman & Bass *Photo-Litho* 236 High Holborn

Wyman & Sons, Printers, 74 Queen St.

TOWN-HALL AND COURT-HOUSE, KINGSTOWN, CO. DUBLIN.—MR. JOHN L. ROBINSON, ARCHITECT.

SULZFELD.

THE "dwarf cities," or fortified villages, of Germany, which played no insignificant part in the history of the Fatherland during the Middle Ages, and by combination, or sometimes even alone, resisted the oppression and tyranny of the most powerful nobles, are rapidly disappearing or changing their character. Modern improvement and centralisation have robbed them of all power, and even of life, and from having remained for the last two centuries mere collections of tumble-down tenements inhabited by agricultural labourers and small shop-keepers, they are now being gradually dismantled. First, a "curtain wall" is thrown down, then go the gates, and in a few more years the quaint old towers are pulled down, the old houses are plastered over and whitewashed, the Rath-haus and church thoroughly restored, and the place rises up like a phœnix from the ashes of the past. But, alas! the new phœnix is a miserable bird; however, as they say, a "live dog is better than a dead lion," and possibly to those that inhabit these villages the rebuilt houses may be more agreeable than the old ones, and the brand new gravel walk round the town may to them be an improvement. How fortunate now are those happy people who are born entirely without an appreciation of the beautiful in art,—people, for instance, who can see more to admire in a Bayswater villa than in a Nuremberg house! Such happy individuals would find little to admire in Sulzfeld, but those who are so unhappy as to admire the picturesque relics of the past would find much to interest them in this curious little town, which retains all its Mediæval fortifications. Like Winchelsea, and several other ancient towns both in England and on the Continent, Sulzfeld is very regularly planned, with perfectly straight streets crossing each other at right angles; the gates are exactly in the centre of the walls and the towers occur at regular intervals. The plan would be a perfectly rectangular oblong were it not that a rock which rises somewhat abruptly on the east side prevented that wall from being carried out in a straight line.

The church and town-hall are near the centre of the little town. The church has suffered from modernisation, but possesses a graceful slate-covered spire. The town-hall (or Rathhaus) is in a style resembling our Elizabethan. It presents a noble lofty gable towards the little market-square, and is really a very dignified-looking structure for such a mere village. It was erected by Bishop Julius of Würzburg (*ob.* 1573). The towers at the angles of the town-walls have peculiar roofs, covered with tiles. The towers themselves as well as the walls were all covered with a coating of plaster over the rubble, and were probably ornamented with coloured decorations, similar to those which we have on a previous occasion noticed at Ingolstadt and Landshut. It is most important both for the cause of archæology and also for the study of Mediæval history that careful drawings and records should be made of such places as Sulzfeld, for when they are destroyed or rebuilt it will be simply impossible for a future generation to realise what they were like, and much of Mediæval history will be unintelligible to readers. For instance, there is a little historical fact connected with Sulzfeld. "In the year 1461 the Margrave Albert Achilles, with his whole army, laid siege to Sulzfeld and hoped to take it without much loss. He was, however, mistaken in his calculations, and had to draw off his men to Kitzingen, taking the dead and the wounded in two wagons."* Now it will be of interest to future historians to know what kind of fortifications could defend a town against the army of a Margrave in the fifteenth century, and yet it will be simply impossible for him to realise what they were like, and thus it is to the interest of the historian as well as the archæologist and artist that such works should be illustrated in a journal like the *Builder*, although they may not offer much in the way of suggestions to the practical architect or contractor.

The Exhibition of the Society of British Artists.—The Council of the Society of British Artists, Suffolk-street, Pall-mall East, have made arrangements to open the exhibition free on Bank Holiday, Monday next, August 2.

* Handbuch für Reisende auf dem Maine. Von S. Hiale und K. von Spruner. 1843

FISHER LADS' INSTITUTE, GREAT GRIMSBY.

THE want of a suitable building wherein to provide for the accommodation of the 2,000 lads engaged in the large fish trade at Grimsby had long been felt, and owing to the generous gift of a site near the docks by Colonel Tomline, an influential committee was formed, with Mr. W. H. Daubney as chairman, Mr. J. K. Riggall as treasurer, and Mr. Orby Bradley as secretary, to whose energy the success of the scheme is largely due, and the building we illustrate has been erected, and was formally opened by the Earl of Yarborough, on Monday last. The earl was accompanied by the Countess of Yarborough; Mr. Edward Heneage, M.P., and High Sheriff of Lincolnshire; Sir Edward and Lady Watkin, Mr. H. Josse, and a numerous and distinguished company of the local gentry. A grand bazaar was then held in the various rooms, towards removing the remaining debt on the building.

The site is at the junction of Oswald and Tomline streets, and has also a frontage to a new street in the rear. The entrance is at the angle, leading into an octagonal hall and lobby. There is a large and lofty lecture-hall and gymnasium, 48 ft. by 28 ft., with an open-timbered queen-post roof, wrought and painted, out of which open various large and lofty rooms, viz., a library, 20 ft. by 18 ft.; reading-room, 24 ft. by 18 ft.; refreshment-room, 25 ft. by 16 ft., all for the use of the lads, and under the general control of a resident superintendent.

Adjoining the lecture-hall is a handsome swimming-bath, 38 ft. 6 in. by 63 ft., with an open roof. The bath is lined with glazed tiles, and there are four private baths above the dressing-rooms, an entrance for which is provided from Tomline-street, where is also a bath-attendant's house. In rear are the engine-house and well for supplying the baths, with offices, &c. On the first floor, reached by the main staircase and by a gallery projecting over into the lecture-hall, are a series of rooms to be used for the various classes for instruction in navigation, &c., and there is a good residence for the agent over the coffee-room. Above, on the attic story, are dormitories for the occasional use of boys who may not have homes elsewhere. The lantern above the entrance is to be used as a "look-out," whence a good view is obtained of the Humber and North Sea. The building is of red bricks, with white and blue bands, stone only being used for sills, &c. The roofs are of blue slate, with green bands. All the finishings are of a very plain but suitable character, and the whole block is pronounced to be a very convenient arrangement for all the present and future requirements for the social comfort of the fisher lads. The architect is Mr. Charles Bell, F.R.I.B.A., of London and Great Grimsby, and the builders are Messrs. Riggall, Hewin, & Topham, of Grimsby. The contract was 2,900*l.*, and the fittings, furnishing, engine, &c., will amount to about 700*l.* more.

KINGSTOWN TOWN-HALL, IRELAND.

THIS new building, which stands at the end of Crofton-road, opposite to the railway station, has been thrown open for use. It contains municipal offices, a public hall, and a commodious court-house, where the county chairman will sit periodically, together with accommodation for the holding of the police-court. Some particulars with respect to the building may not at the present moment prove uninteresting. So long ago as 1866 the Town Commissioners, feeling the want of such accommodation as that which the new building provides, advertised for plans and specifications, but the difficulties which were thrown in the way of procuring a suitable site caused the scheme to lapse for a time. In 1874 it was revived, and in August of that year, the difficulties with regard to the site having been obviated, the plans sent in by Mr. J. L. Robinson, 198, Great Brunswick-street, Dublin, were selected, and tenders advertised for. The position is most excellent,—central, prominent, and convenient. The amount of the contracts and extras was about 14,000*l.*; but it is estimated that the entire building, when furnished, will cost at least 16,000*l.*

The architecture is after the Italian style. The main frontage is on the Royal Marine-road, where the façade measures 130 ft. The main entrance is situated in the centre of this front. Passing through the doorway, the hall, 16 ft. wide by 22 ft. long, is reached. The bottom story, 16 ft. 2 in. high, contains the court-house, which is 39 ft. by 30 ft., with rooms for witnesses, barristers' rooms, clerk of the peace's offices, the jury-room, the judges' retiring-room, closets, lavatory, &c. On the left-hand side of the main entrance, on the same story, are offices for the town clerk, the town surveyor, the rate-collector, and the sanitary inspector.

The next story is 22 ft. high. It is approached by a grand staircase, and contains the assembly-room, a lofty apartment, 70 ft. 6 in. long by 41 ft. 6 in. wide, with moulded roof and cornicer. The interior fittings of the assemby-room will consist of a platform of pitch pine and American walnut, for the accommodation of performers. The board-room, in which the town commissioners will hold their meetings, is also situated on the second story. Its size is 30 ft. by 39 ft. The walls are covered to a height of 6 ft. with a panelling of pitch pine and American walnut, richly moulded. The furniture of the board-room has been designed by the architect, and will be of massive oak, in keeping with the rest of the building. The assembly-room will, of course, be devoted to public meetings, concerts, and entertainments which may be held in the township.

The second story contains, in addition to the rooms mentioned, the town clerk's office, a commissioners' retiring-room, and some clerks' apartments, the latter being exceedingly well planned and comfortable. The entire of the corridors will be furnished with fancy tesselated tiling.

The entire height of the building is 50 ft. from the floor balustrade. A tower, 120 ft. high, surmounts the court-house entrance in Crofton-road, in which there will be a clock, situated at a height of 80 ft. above the ground. The commissioners have entered into a contract for the erection of the clock with Messrs. Chancellor, of Sackville-street.

The windows of the building are all circular-headed, and those of the principal stories are constructed with nook-shafts in angles, with carved capitals, moulded arches, and hood-moulds. Polished Aberdeen granite columns ornament the windows over the main entrance in Royal Marine-road and the board-room windows.

The building is capped by a cornice, supported by granite brackets, with a pierced parapet over; the roof, high-pitched, covered with slates in bands, and decorated with a metal cresting. The materials which were used in the construction of the building are local chiselled granite ashlar for the main walls, with Bath stone cornices and arches. Various descriptions of stone have been introduced by the architect where their colour serves to emphasise the leading lines in the architecture.

The contract has been carried out by Messrs. Meade & Son, Great Brunswick-street, in a way to give satisfaction.

PERMANENT ART GALLERY AND MUSEUM FOR BIRMINGHAM.

MESSRS. R. and G. TANGYE, of the eminent engineering firm of Tangye, Brothers, & Holman, whose extensive works are situate in Birmingham, recently offered to contribute the munificent sum of 10,000*l.* towards the purchase of examples of art for exhibition in a public art-gallery in Birmingham on condition that the Town Council should make provision for a permanent art-gallery on a scale commensurate with the necessities of the town. We now understand that an arrangement is likely to be arrived at by which the town will be enabled to accept the generous offer of Messrs. Tangye, and to enjoy the use of the valuable collections of works of art and art manufactures which it already possesses. The General Purposes Committee and the Art Gallery Committee of the Town Council have met and conferred upon a proposal by which that portion of the site of the Municipal Buildings which is at present uncovered will be devoted to the erection of buildings of which the basement and ground-floor will be used by the Gas Committee, and the upper portion will be available for art-galleries and a museum on a scale worthy of the town and of the subject. It is stated that a plan by which this desirable object can be effected without burdening either the special Free Libraries rate or the general rates of the borough, will be suggested to the Town Council at its meeting next Tuesday.

THE PARKES MUSEUM OF HYGIENE.

THE first public annual meeting of the friends and supporters of this Museum was held on Tuesday afternoon in the Egyptian Hall of the Mansion House, the Right Hon. Sir Francis Wyatt Truscott, Lord Mayor, in the chair. There was a large attendance, including, among many others, Earl Fortescue, Sir William Jenner, Mr. Erichsen, F.R.S. (President of the Royal College of Surgeons), Sir Joseph Fayrer, Mr. Sheriff Bayley, Mr. Erasmus Wilson, Mr. George Palmer, M.P., Mr. Edwin Chadwick, C.B., Mr. Horace Jones (City Architect), the Master of the Clothworkers' Company, Mr. R. Rawlinson, Mr. Chatfeild Clarke, Mr. H. H. Statham, Miss Muller and Miss Richardson (members of the London School Board), Dr. Wilson Fox, Mr. Berkeley Hill, Dr. G. V. Poore, Dr. Corfield, Mr. Talfourd Ely, Mr. Mark Judge, &c.

The Lord Mayor, in opening the proceedings, expressed the great pleasure it gave him to allow the meeting to be held in the Mansion House, and to be the means of introducing an institution of such value and importance to the notice of the citizens of London.

An astounding list of letters from well-known and eminent persons was read, expressing regret that they were unable to be present on that occasion, and all expressing deep concern in the maintenance of the Institution. From amongst these we would especially notice one from the President of the Royal Institute of British Architects, Mr. Whichcord, desiring it should be understood that the Institute felt the deepest interest in all institutions tending to spread abroad the truths of sanitary science.

Dr. G. V. Poore, hon. sec., then read the following report of the executive committee:—

"The Parkes Museum was formally opened to the public on the 28th of June, 1879, by the Right Hon. Sir Richard Cross, M.P., the Home Secretary, who was accompanied on the occasion by other members of the late Government, a large and influential company being present. The Executive Committee are happy to be able to state that the first year of real work so brilliantly inaugurated has been one with which, in many respects, they have a right to feel satisfied. The experience of this first year has taught them that the Museum supplies a real want, and that the efforts which have already been expended in establishing it have not been thrown away. The Museum has been open free to the public on three days in each week, and since the 1st of January, 1880, the number of visitors, of whom a record has been kept, has been 2,166. This result must be regarded as decidedly satisfactory when it is borne in mind that the Museum is situated on the top floor of a building which is somewhat removed from the great centres of traffic, that it is as yet but imperfectly known to the public, and that the Executive Committee have not felt themselves justified in spending any large sum in continuously advertising its existence. They have at least the satisfaction of knowing that the success which has hitherto been attained is solely attributable to the fact that the Museum is found to be useful to a considerable section of the public. During the past winter a series of demonstrations were given on Saturday afternoons by members of the Executive Committee. The first series, by Professor Corfield, Dr. Steele, and the Honorary Secretary, was given for the benefit of members of the Working Men's Club and Institute Union, and comprised the subjects of House Drainage, Ventilation, Lighting and Warming, Food, and the Management of the Sick-room. The second series, by Professor Corfield and Mr. Rogers Field, was given to members of the Institution of Builders' Foremen and Clerks of Works, and comprised the subjects of Ventilation and House Drainage. Both series were numerously attended. Dr. Ralfe, one of the lecturers on Hygiene appointed by the Society for the Extension of University Education, made application for the admission of his class to the Museum, an application which was at once acceded to. Dr. Steele more than once brought a party of nurses from Guy's Hospital and exhibited to them the large collection of apparatus for use in the sick-room which is to be found in the Museum. The Committee are further informed by Dr. Corfield, the Professor of Hygiene at University College, that the Museum has been of great service to him in imparting a practical knowledge of sanitary science to his class. His Cantor Lectures, also, at the Society of Arts, were largely illustrated by articles borrowed from the Museum. Thus it will be seen that the institution has been made use of not only by the casual visitor, but also for the purpose of affording systematic instruction to persons who are peculiarly interested in special subjects. The Committee wish it to be understood that they will gladly entertain applications from persons engaged in tuition who may wish to bring their pupils to the Museum for the purpose of practical instruction. Her Majesty the Queen, our patron and a munificent contributor, has been graciously pleased to accept a copy of the first edition of the illustrated catalogue, as has also His Royal Highness Prince Leopold. A considerable amount of encouraging support has been afforded to the Museum during the past year. His Grace the Duke of Northumberland, the President of the Sanitary Institute of Great Britain, honoured the inaugural meeting with his presence, and spoke most approvingly of the objects of the Museum; and the Baroness Burdett-Coutts has lent us the weight of her great influence by becoming a patron. The Clothworkers' Company have made a second donation of fifty guineas, and the Company of Drapers have given a similar amount, while the Merchant Taylors' Company have given ten guineas. The Committee trust that the generous example of these worshipful companies may be followed by others of the ancient City guilds and the wealthy citizens of London, and that a recognition will be made of the fact that sanitary science is, of all sciences, the one in which technical instruction is most needed, and that a thoroughly practical knowledge of the laws of health must inevitably increase the welfare, the prosperity, and the happiness of this great country. The different sections of the Museum have been considerably enriched during the past year. Contributions to the library continue to be made by the various departments of the Government which take cognisance of sanitary matters. The National Board of Health of the United States of America has undertaken to furnish the Museum with its weekly bulletin, and the President and Council of the Epidemiological Society have presented upwards of 200 volumes of books, some of which are of great interest and value. The Food Collection is still receiving the thought and attention of Mr. Twining, of Twickenham, and the Committee have been glad to leave the arrangement of this section entirely in the hands of that gentleman, whose knowledge of the subject and whose genius for organisation are a sufficient guarantee that, when completed, the food collection of the Parkes Museum will leave nothing to be desired. The Museum of Economic Botany at Kew has sent nearly 1,000 specimens of food products of great value, all of which will be utilised by Mr. Twining in his arrangement. The sections of Architecture, Engineering, Furnishing, Preservation, and Relief have all steadily increased in size during the past year, the only section of the Museum which has shown no tendency to expand being that devoted to Clothing, notwithstanding that the subject, in our variable and often trying climate, is one of prime importance. No changes have taken place in the executive staff during the year, excepting the resignation by Dr. Gowers of the post of Joint Honorary Secretary; but as he still retains his seat at the Committee, the Museum will not be deprived of his valuable advice and aid. Although the area which the Museum at present occupies is considerable, the Committee are beginning to feel that the space is too small, and must at no great distance of time become altogether inadequate. On the other hand, the calls upon the space in University College are so numerous that evidence is not wanting that the Council of that college will not improbably be obliged to discontinue the hospitality which they have hitherto shown to the Museum, a hospitality which they have always warned us must be temporary, and not permanent. The provision of a new home for the Museum has, it may be said, already become a necessity, and there can be no doubt that the removal of the collection to a building specially designed for it in some central position would prove a great benefit to the Museum and a great boon to the public. The sum required to effect the transference of the Museum from its present temporary home to a permanent and a suitable one will doubtless be large, but the Committee trust that the goodness of their cause and the great utility of their undertaking will commend itself to the philanthropic and the wealthy. Lastly, as to the financial position of the Museum. Since the spring of 1876 to the present time 1,285*l.* has been subscribed. Of this 641*l.* has been expended in museum fittings, in paying the salary of a curator, and in other unavoidable expenditure. 600*l.* has been invested, which yields an income of something less than 24*l.* per annum; and the treasurer has 65*l.* in hand. The Committee wish to dwell upon the fact that the Museum is free in every respect. No charge is made to visitors at any time. No charge is made for space, suitability being the only condition for the acceptance of any object. Thus it will be seen that the Museum is entirely dependent upon voluntary contributions. The Executive Committee are determined that the institution shall remain a true museum, and not become a mere show-room for manufacturers and patentees. To achieve this object, a permanent home for the Museum must be found, and a sufficient sum be provided to meet the annual expenditure. In a building of its own, in a central position, the Museum would be one of the most useful institutions in the metropolis; and, while perpetuating the memory of a man who will always be recognised as one of the great benefactors of the human race, would greatly facilitate the dissemination of a knowledge of the laws of health, so important to all classes and both sexes. The Committee, therefore, confidently appeal to the public for the necessary funds."

The Right Hon. Earl Fortescue then moved,—

"That the first annual report, which has been read, affords conclusive evidence that the Parkes Museum of Hygiene is meeting a great educational want, and is eminently worthy of public support."

In the course of his remarks his lordship observed that after labouring for between thirty and forty years in the cause of sanitary reform, he felt that that cause was worthy of greater zeal and greater sacrifices than he had ever been privileged to make on its behalf, and it was well deserving of the support of every lady and gentleman present, individually and collectively, because it concerned the economical, physical, moral, and religious welfare of the community. Experience had fully shown that dirt, disease, and crime were found to be concurrent. In the cause of sanitary reform, the Museum on behalf of which he was speaking, and which bore the name of a noble and beneficent man who rendered great services scientifically and practically in the promotion of hygiene, was calculated to do great good, for in it were shown and exemplified not only the general laws of sanitation, but the improvements and advances which were made from time to time by the professor of hygiene, and by the engineer, the architect, the surgeon, and the chemist. The lectures and demonstrations given to workmen and students from time to time would gradually tend to a wider dissemination of the laws of health. On these and other grounds he had much pleasure in moving the resolution.

Mr. George Palmer, M.P., in seconding the motion, expressed his gratification in seeing the meeting so largely attended by ladies, for it was unquestionable that the ladies, if acquainted with the laws of health and the principles of sanitary science, could (especially when, as district visitors in connexion with parochial and other organisations, they came much into contact with large masses of the population) do much good in educating the people in the laws of health, and they would be thus greatly facilitating the work of the various sanitary authorities throughout the country.

The President of the Royal College of Surgeons, Mr. Erichsen, F.R.S., in supporting the motion, observed that it had been truly said by Lord Fortescue that a museum such as that which they were assembled to support should be looked upon with a view to the preservation as well as the restoration of health. There was one aspect in which the usefulness of the Museum in aiding in the restoration of health might be looked upon with great hope of benefit, for the Museum was one designed not only for the advantage of the general public, but for the information of managers and surgeons of hospitals and other institutions intended for the cure of disease and the alleviation of physical suffering. It was the undoubted duty of all who had any voice in the management of such institutions to study the laws of health and the appliances whereby health could be preserved to its possessors and restored to those who had,—from accident or other causes,—been for a time deprived of its blessings, with a view to the application in such institutions of those laws and appliances. If there was one point that had been more incontestably esta-

blished than another of late years in surgical practice, it was that the recovery of a wounded person was less dependent upon the surgical skill with which he was treated than upon the hygienic conditions by which he was surrounded whilst under treatment. Indeed, the highest surgical skill might be rendered absolutely nugatory by the absence of proper hygienic conditions. It had been shown beyond the possibility of a doubt that in all large establishments for the reception of wounded people,—whether they were struck down on the battle-field or were the victims of the numerous accidents which occurred in civil life,—that the recovery of the patients was dependent almost entirely upon the hygienic conditions by which they were surrounded subsequently to the receipt of their injuries. There were establishments (happily rare in this country) in which, until within recent periods, it was an exceptional thing for a patient to recover after an amputation; and in one large hospital on the Continent, it was publicly stated six years ago by its surgeon that 80 per cent. of the patients who had undergone surgical operations were killed by pyæmia, gangrene, or some other disease the result of bad hygienic conditions. It was well known that, given certain favouring conditions, what might be called solely "hospital diseases" would be generated within the walls of hospitals, but the generation of such diseases was entirely preventable by the adoption of proper sanitary precautions. It was, therefore, the duty of all who had the control and management of hospitals and kindred establishments to see that the hygienic conditions and sanitary appliances were as perfect as they could be made, for the poor patients themselves had a right to expect that they should not be exposed to danger in the places, above all others, to which they were taken for succour and relief. From the point of view of a surgeon, therefore, he regarded the lessons capable of being taught by and in the Parkes Museum as fraught with incalculable value.

Mr. Erasmus Wilson, F.R.S., also supported the motion at some length, pointing out that such scourges as ringworm were entirely preventable by proper attention to the laws of hygiene.

The motion having been carried unanimously, Professor Berkeley Hill, treasurer, read a list of subscriptions.

Sir William Jenner, F.R.S., moved the following resolution:—

"That the best thanks of this meeting be accorded to the Right Hon. the Lord Mayor for granting the use of the Egyptian Hall for the first public annual meeting of the Parkes Museum, and for having presided on the occasion."

He referred to the history of the formation of the Museum, which was, he observed, established as a memorial of one of the most amiable and self-denying men who had ever lived. Professor Parkes was eminently a lover of his race, and, as was well known, he devoted many of his best years to the subject of hygiene. Those who knew him in life sought to perpetuate his memory in some practical form when he was dead. They loved him too well to require to see his picture before them. Scholarships were suggested, but scholarships, though to some extent useful, would not have accomplished the end in view, and which he, good man, could have wished. So it was ultimately decided to establish a museum which should spread abroad a knowledge of hygiene; but it was felt that merely to get together a collection of appliances and materials without explaining them and expounding the principles on which they were based would be almost useless, and therefore it was decided that part of the scheme of the Museum should be the delivery of lectures to working men not only that *their* homes might be made healthy, but that the homes of those for whom they worked might be healthy. It was too often forgotten that by the neglect of sanitary laws the mansions of the rich might be as unhealthy as some of the cottage-dwellings of the poor. Only a few days ago a lady, desirous of taking a town mansion as a residence for herself and her invalid husband, wisely took the precaution of having it examined by a competent person as to its sanitary condition, with the following results as summarised by her:—

"*One of the Finest Mansions in London.*—The waste-pipes of all the baths descend into the soil-pipe unventilated. The closets are valve-closets in the best parts of the house, but the closet-rooms throughout are unventilated, except in one instance. The main cistern on roof supplies the water-closets and drinking water, and has its overflow-pipe directly connected with the drain."

That, he was sorry to say, was but a type of the sanitary condition of many of the largest houses in London, and it was with a view of remedying such a state of things that the Parkes Museum was established. Now, as Chairman of the Executive Committee, he appealed for funds for carrying on the Museum, and that with increased efficiency and usefulness. He was not pleading for a charity, unless for that charity which should properly begin at home, although it should not end there,—for sanitary science would benefit everybody who chose to profit by its teachings. It was through the violation of sanitary laws that so many people were continually liable to complaints and disorders, which, while not absolutely incapacitating them for work, subjected them to chronic out-of-healthiness. The breathing of foul air was one great predisposing cause of such unhealthiness, and the Parkes Museum would teach those who cared to learn how foul air might be avoided. The great bulk of the workmen engaged in plumbing and other work connected with house-building were, he believed, anxious to do their work well and in such a way as to conduce to the health of the public, but, unfortunately, they were too often sadly ill-informed in the principles of sanitation, and did their work unthinkingly according to the old methods. Having cited from his own experience one or two instances of the ignorance and carelessness of sanitary laws shown by plumbers, and condemning the lead D-trap as a "Double D" trap,—"a disseminator of disease and a dealer-out of death,"—Sir William appealed to the wealthy citizens of London,—for their own health's sake as well as for the sake of the health of others,—to support the Parkes Museum of Hygiene in a manner commensurate with its great claims.

Mr. George Godwin said he had much pleasure in seconding the resolution, thanking, as it did, the Lord Mayor for the readiness with which on the present, as on numberless other occasions, he had hastened to do good. The present mayoralty,—as all who had had occasion to watch it knew,—had been a brilliant one, and the record of the meeting which was then assembled would certainly not be the least interesting item in the history of it. Assuming for a moment that the public had now, thanks to the labours of a small band of men,—several of whom were upon that platform, Mr. Chadwick, Mr. Robert Rawlinson, Lord Ebrington that was, and Lord Fortescue that is,—arrived at such a state of mind as to see the advantage of healthy homes, they would naturally ask how they were to obtain them, and what they ought to be. These questions would be answered by study of the contents of the Parkes Museum of Hygiene. And this might be expected to remove some of the ignorance which had existed, and did exist, as shown in the want of ventilation in our houses, want of knowledge of the best means of providing it; the state of the drains, and the execution of the plumbing-work. He had a house in his mind at that moment, a house of 400*l.* a year, wherein the soil-pipe was full of holes, admitting sewer-gas to the rooms, and so placed that this could not be remedied without an amount of destruction that deterred the owner from attempting it. The waste of water, again, and of gas, through want of knowledge, was immense. Quite lately, in the small town of Penzance, by simply inspecting and revising some of the details of the taps and other water fittings, 100,000 gallons of water per day had been saved,—and that in a portion only of the town,—without any diminution in the supply to the inhabitants. Then, again, the Parkes Museum was likely to be instrumental in dispelling some of the ignorance which had lately resulted, and would continue to result, in gas explosions. How could we wonder that gas explosions occurred when it was found that, at the inquest on the men killed by the Tottenham-court-road disaster, the foreman of the men declared on oath that he had not the slightest idea that a compound of atmospheric air and coal-gas would produce an explosive mixture? The moral of all that had been said was that the public and the Government were bound to aid such an establishment as the Parkes Museum of Hygiene. The disadvantages under which the Museum at present suffered must be removed. It was necessary that it should have a habitation of its own, centrally situate, and easily accessible by being on the ground floor, and to which every patentee and inventor of sanitary appliances and materials should be invited to lend, if not to give, his productions, and so aid in getting rid of the ignorance which was the mother of disease and death.

Sir Joseph Fayrer, in supporting the motion, said it was gratifying to see that the principles of sanitary science were now taught in our medical schools and at our universities.

The motion having been carried by acclamation,

The Lord Mayor, in reply, said he felt he had done right in acceding to the request that he should allow the meeting to be held in the Mansion House, and he hoped that the result of it would be to establish the Parkes Museum so firmly in public favour that it would soon be housed in a building not only its own, but one worthy of its object.

We may, perhaps, usefully add that the Museum is open free on Tuesdays, Thursdays, and Saturdays, from ten to two.

THE NATIONAL ASSOCIATION OF MASTER BUILDERS.

THE half-yearly meeting of the National Association of Master Builders of Great Britain commenced in Bristol on Tuesday last, and was attended by from 140 to 150 delegates from all parts of the kingdom. The chair was taken by Mr. Stanley G. Bird, of London, in the absence of Mr. Thomas Clay, of Manchester, the president. The following were the delegates appointed to attend the meeting:—

Manchester—Thomas Clay, William Southern, Robert Neill, jun., John Elms, Geo. Napier, Thomas Daruborough, Wm. Clark. Croydon—C. Bowyer, J. W. Hobbs. Leeds—Wm. Nicholson, C. Myers, E. Wray. Liverpool—Edwd. Hughes, Wm. Callaghan, William Litt, J. C. White (president), Jas. Leslie and John Wannop (vice-presidents), Chas. Tomkinson (treasurer). Liverpool Builders' and Property Owners' Association—Jas. Thomas, Robt. H. Bullin, Owen Owens (secretary). London—Stanley G. Bird, J. Coles, G. H. Trollope. Crewe—A. P. Cotterill, James Woods, Joseph Latham, — Matthews. St. Helens—Wm. Harris, Wm. Belshaw. Birmingham—W. H. Parton, C. W. Barker, Walter Clulee (secretary). Wakefield—Fawcett John Summers. Leicester—S. Barfield, E. B. Piper, Thomas Mason. Lancaster—Christopher Baynes, Charles Calvert, John Kitchen. Nottingham—Robert Dennett. Warrington—William Gibson. Wolverhampton—G. Higham, H. E. Barnado (secretary). Wigan—C. B. Holmes, Wm. Winnard, A. Wigans. Huddersfield—Wm. Radcliffe, Samuel Sykes. Lincoln—Wm. Sims, Wm. Kirk, H. S. Close. Widnes—Jas. W. Carlisle, Jonas Foster, W. H. Kershaw. Derby—J. Walker, S. Tinkler. Kidderminster—B. Thompson, Thos. Vale. Bolton—Mr. Dickinson, Mr. Cuerden, Mr. Radcliffe. Bradford—John Beanland. Edinburgh—John Sutherland, Thos. Bonnor. Glasgow—Robert Anderson. Dundee—Alex. Mackay. Walsall—James Rowley, James Adkins. Hull—A. W. Stanley, R. Bever, Richard Hodson, W. Knox (secretary). Doncaster—Wm. Johnson, John Athron. Warrington—R. W. Collin, John E. Wright. Bradford—Wm. Moulson, Wm. Holdsworth. Walsall—Moore, Alfred Lynese. Worcester—J. S. Wood (chairman), John Kendrick (vice-chairman), John Grisman.

The following Bristol members also attended:—

Messrs. John Thorn, J. Eastabrook, J. Perkins, A. Krauss, J. Wilkins, W. Church, G. Humphreys, W. H. Phillips, G. S. Nipper, Thos. R. Lewis, C. H. Foley, S. Robertson, J. R. Shorland, W. R. Thomas, and W. Benson (solicitor). The Mayor (Mr. H. Taylor) was also amongst those present.

At the commencement of the proceedings on Tuesday, the Chairman said he very much regretted having to take the chair, and he was quite sure they would agree with him when he mentioned that it was owing to the illness of the President, Mr. Clay. Their President came to Bristol intending to take part in the business of the meeting, but he had been taken suddenly ill. Before commencing the proceedings he begged to tender to the Mayor of Bristol their thanks for the kindly welcome given by the city of Bristol to the association.

The Mayor, who was received with applause, said he had great pleasure in being present and in giving the association a hearty welcome to Bristol. He was very glad to see them, more particularly as they were engaged in a business with which he was to some extent connected. He regretted the absence of the President, and hoped that their proceedings would not suffer in consequence. He need hardly dilate upon the necessity and importance of such a society. They found labour combining for its own ends, and it was necessary for the employers to combine also for their own protection. The objects of the society were good, and he trusted that the association would continue for many years.

The Secretary (Mr. Knox) read the minutes of the last meeting at Sheffield, and then the report of the Council. They had obtained particulars from ninety-eight of the principal towns of the kingdom with reference to the rate of wages paid. The depression of trade still con-

tinued, and the large supply of labour had a tendency to bring down prices. In Bristol many men were to be obtained at less than the recognised rate. The Council recommended, as regarded apprentices, that the employers should put themselves into communication with the masters of schools in their respective districts, with the view of obtaining boys of good education, as that would be the means of raising the standard of the operatives in the building trade. The Council had taken action with reference to the liability of employers for injuries caused to their workpeople by negligence, and many amendments had been proposed to the Bill. The Council hoped that if the Bill were carried the amendments would be adopted. The finances were in a satisfactory condition. There was a balance in favour of the association of 329*l.* 8*s.* 10*d.*

The report and accounts were adopted.

It was resolved that the next meeting should be held at Manchester.

A discussion took place as to the liability of builders to pay for the use of roads, and it was pointed out that it was only in cases of extraordinary use that they were called on to pay.

Mr. Hatherley considered it was but fair that if they used a road more than in the ordinary way they should pay for it.

The Chairman then introduced the subject of the Employers' Liability Bill. He said the Government adopted Mr. Brassey's Bill, and, like much of the legislation that had gone on lately, there was a good deal of slap-dash about it. Mr. Gladstone found that the Bill was quite impracticable, that it was not a fair Bill, and that he could not carry it. He, therefore, withdrew the Bill and took it into a committee of the House. The Government then re-considered the matter, and brought in a second Bill, and it was called the Employers' Liability Bill, as amended in committee. He read the Bill, and pointed out that the principal and important clause was the following, making an employer liable,—

"By reason of the negligence of any person in the service of the employer to whose orders or directions the workman at the time of the injury was bound to conform or did conform; or by reason of the act or omission of any person in the service of the employer done or made in obedience to the rules or bye-laws of the employer, or in obedience to particular instructions given by any person delegated with the authority of the employer in that behalf."

The builders had a great many objections to the Bill. It really made them liable for the acts of one-fourth of the men in their employ, and in some trades for those of every other man. There were various amendments proposed, and they hoped to be able to carry some of them, so as to make the Bill more fair. They hoped to get the insurance clause passed, although there would be very great difficulty in working it as far as the builders were concerned. It would cut the ground from under the feet of the trade unions; for although they ostensibly obtained their funds for sick benefit, they used them for the purposes of strikes. He hoped they would limit the liability to 150*l.* At present they would be liable to the extent of 300*l.* The Council would watch the progress of the Bill.

Mr. Leslie thought the liability should be reduced to 100*l.* He moved a vote of thanks to the Council for their action in the matter. The motion was carried unanimously.

Mr. E. Hughes, of Liverpool, read a paper on the measurement of work and the mode of taking out quantities. A vote of thanks was passed to him.

In the evening the Mayor entertained the members of the society at dinner in the Mansion House.

On Wednesday the members visited Chepstow and Tintern Abbey.

Lincoln.—The new Wesleyan Mission Chapel, at the corner of Derby-street, St. Catherine's, Lincoln, has been opened. Mr. Charles Bell, of London, is the architect. The trustees have decided to confine themselves for the present to the adoption of a portion of the plans, viz., that for the school, and to use the building for religious services, as well as Sunday-school work proper, until the entire block of buildings is completed. The building, the contract for which was entrusted to Messrs. Cowan & Lansdown, builders, Lincoln, contains a large room, 46 ft. by 34 ft., with four class-rooms. The cost of this building, including land, has been about 1,200*l.*

FEDERATION OF BUILDING TRADE EMPLOYÉS.

ATTEMPTS have been made on several occasions during the past few years to federate the whole of the trade unions of the United Kingdom, but each attempt has failed. The cause of these failures is mainly to be ascribed to the diversity of interest and customs existing in the many and varied branches of industry which form the trade-union movement in the country. It would now appear that there is a prospect of successful federation in the several branches of the building trade. A conference, which had been sitting for four days at the office of the Bricklayers' Society in Stamford-street, London, closed its deliberations on Friday, the 23rd inst. It was attended by representatives from the Almalgamated Carpenters and Joiners, the National Association of Plasterers, the London District Association of Plasterers, the House Decorators and Painters, and the Operative Bricklayers' Society. It is reported that the masons will shortly join the movement. It is understood that the contribution will be about 6*d.* per annum per member, with 1*s.* per member entrance-fee. The following is the preamble agreed to before the Conference closed its sitting:—

1. That the objects of this Federation shall be to promote a knowledge of the principles and advantages of trade unionism amongst the operatives engaged in the building trades.
2. To secure unity of action amongst the organisations established in the building trades.
3. To endeavour to obtain, as far as is practicable, in each town or city a uniformity of working-hours in the different trades.
4. To render assistance to any trade in the Federation desirous of resisting an aggression on the part of their employers, or of endeavouring to improve their social position.

Name of Federation.—The National Federation of Building Trade Associations.

A sub-committee was appointed to inquire into and report upon the most desirable place for central offices and other details connected with the organisation.

THE NEW BOOTLE DOCKS.

THE new Bootle Docks are likely to be completed and opened at the close of the current year. The works were commenced in October of 1873. The scheme, of which we get particulars from the *Bootle Times*, consisted of an enlargement and alteration to the form of the present Canada Basin, with a double entrance, 65 ft. wide, on its north side, leading into a half-tide dock of 18 acres. This dock is formed somewhat in the shape of the letter L, and from its eastern extremity, or the top of the letter, there runs a branch dock of three acres, and two graving-docks of 950 ft. in length each. These are sub-divided by intermediate gates into lengths of 500 ft. and 450 ft. respectively, and are provided with powerful pumping machinery of the turbine type. This half-tide dock also communicates, by means of a passage 50 ft. in width, with the Brocklebank Dock. In its north-west angle a double passage, 60 ft. in width, leads into the steam-dock, that is to say, a dock suitable for the largest class of steamers which frequent this port. The form of this dock is somewhat peculiar, the design being particularly adapted to the trade in question, which requires a minimum of water-space combined with a maximum of quayage. The main body of the dock, 1,600 ft. in length and 500 ft. in width, runs parallel to the river, and at right angles to this portion run three branches in an inland or easterly direction, averaging about 1,350 ft. in length by 300 ft. in width. The total area of the dock, with its branches, is 43 acres, and the lineal quayage is equal to 11,000 ft. All the quays of this dock will be flanked by sheds 95 ft. in width, and on the west quay of the half-tide dock, called the Langton Dock, there is a shed 1,200 ft. in length and 80 ft. in width, as well as one of 900 ft. in length and 95 ft. span, which is now being erected on the north quay of the Langton Branch. On the north side of, and leading out of the Steam Dock by a passage 50 ft. wide, is another dock of 18 acres, capable of affording accommodation to any trade which it may be found desirable to locate there. As yet, however, little beyond the formation of the passage by which it is entered has been done towards its construction. The most interesting features in the design and construction of these works are doubtless connected with the construction of the main entrances and the alterations to, and extension of, the Canada Basin. In order to maintain the approaches and the sills of these entrances free from the silty matter with which the waters of the Mersey are heavily laden, a gigantic system of sluicing has been carried out, which presents many entirely novel features, and is probably quite unique in the history of hydraulic engineering. As an instance of its magnitude, the dimensions of the feeding culverts may be mentioned. The largest of these are 15 ft. by 13 ft., and 12 ft. by 12 ft., while at a level of 15 ft. below the level of low water of spring-tides as many as four lines of pipes, 3 ft. in diameter, have been laid, which will enable the sluicing-power to be brought to bear on all portions of the basin, no matter how distant from the side walls. This work can only be carried on at low water of spring tides, and the great depths at which the work has to be laid, as well as its inconvenient position, naturally makes it very costly and tedious. For the last two years or more, the night tide work in connexion with this basin has been carried on by the aid of the electric light, and eight powerful lamps, giving an aggregate illuminating power equal to 48,000 candles, are now used with the most advantageous results. The available depth of water in the main entrances and principal passages between the various docks on high water of a spring-tide will be 33 ft. The aggregate area of the water-space comprised in the scheme is 82 acres, and the total lineal quayage is equal to 20,000 ft. The Parliamentary estimate for the scheme was 2,691,000*l.* The water was admitted into the Langton Half-tide Dock and branch early in March, 1879, and the Langton Graving Docks were formally opened to the public a fortnight ago, and it is intended to open the remainder of the work, with the exception of the dock to the extreme north, by the end of the present year. An idea of the magnitude of this undertaking may be derived from the following statistics of the excavations involved and materials employed in the construction of the works. Over 4½ million cubic yards of material have been excavated, and 450,000 tons of gravel or shingle, 75,000 tons of Portland cement employed in the concrete work, and 6½ millions of bricks used in the erection of the sheds and other buildings.

The works have been carried out by the Mersey Docks and Harbour Board's experienced engineer-in-chief, Mr. G. F. Lyster.

REBUILDING AND REPAIR OF METROPOLITAN BRIDGES.

APPOINTMENT OF AN ASSISTANT-ENGINEER.

AT the meeting of the Metropolitan Board of Works on the 23rd inst., an important report from the Engineer, Sir Joseph Bazalgette, was submitted as to the works which are, in his judgment, urgently necessary for the repair and maintenance of the bridges vested in the Board under the Metropolitan Toll Bridges Act, 1877. The first recommendation was that the necessary works for deepening the foundations of Waterloo Bridge be forthwith carried out as recommended in the report of the engineer, at an estimated cost of 40,000*l.*; that notice be sent the Thames Conservators that the Board are about to execute the proposed works, and that a sketch-plan of the same be forwarded to the Conservators.

Mr. Selway, the chairman of the Bridges Committee, in moving that this be adopted, said it was pointed out by their own and other engineers, when negotiations were going on for the purchase of Waterloo Bridge, that the foundations of the piers had been weakened by the scour of the river. At the present moment no damage had occurred to the structure, but should the foundations not be attended to, and a settlement take place, nothing could restore it, and a permanent disfigurement of that noble structure would be the result. The evil was going on day by day, and the state of the piers would get worse, therefore the sooner something was done the better. The Board was now asked only to authorise the committee to take the necessary preliminary steps.

The report was adopted.

The next recommendation of the committee was that application be made to Parliament in the next session for powers to enable the Board to deepen the channel and enlarge the span of Vauxhall Bridge, at an estimated cost of 45,000*l.*

Mr. Selway explained that the piers of this

bridge were weak, and the openings narrow. The tide was very strong at times, and accidents were liable to occur.

The recommendation was agreed to.

The next item in the report was a recommendation that application be made to Parliament in the next session for powers to rebuild Battersea Bridge, at an estimated cost of 250,000*l.*

Mr. Selway said he assumed every member of the Board was acquainted with Battersea Bridge. It was a timber bridge, a narrow bridge, and (he thought a voice said) a disgraceful bridge. It had been patched up many times, and the piles in the ground were no doubt more or less decayed. It was absolutely necessary to have a proper bridge and suitable approaches.

Mr. Elt said that when he read the whole report of the committee, and found it was proposed to expend sums that would amount to something like three-quarters of a million, it almost took his breath away. He thought when the ratepayers knew of the proposition, their joy of having free bridges would be somewhat damped. The question was, Was it necessary to have these works carried out? Would the bridges have been repaired to such an extent, or rebuilt, had the Board not purchased them? He agreed that something was necessary to be done to Waterloo and Vauxhall bridges, but he could not see the necessity for the other proposed works.

Mr. Richardson pointed out that, according to the Act of Parliament, it was the duty of the Board to maintain the bridges.

Mr. Munro supported the report most cordially, though the district he represented (the East of London) possessed no bridge accommodation whatever. The freeing of the bridges had imposed upon his ratepaying constituents a rate of 1*d.* in the pound, but that they cheerfully paid for the good of the metropolis. Perhaps the Board might think he was speaking with a sense of favours to come. Possibly he was, but not for a year or so. When he did come to the Board, he hoped it would be remembered how the East End of London had approved of the Bridges Committee's reports.

Mr. Freeman observed that the Board had at present no power to build bridges, and all they asked to do now was to obtain that power from Parliament.

The report was then adopted.

The next recommendation was, that application be made to Parliament in the next Session for powers to enable the Board to rebuild Putney Bridge, and improve the approaches thereto, at an estimated cost of 300,000*l.*

Mr. Selway pointed out that the bridge was originally built, according to the little book written by Mr. T. E. Jones [and lately noticed in the *Builder*], clerk to the Fulham District Board, to allow the King a short cut to Richmond; but now both sides of the river were crowded with houses, so that a better bridge was necessary.

Mr. Lammin pointed out that, at the earliest, a new bridge could not be constructed till 1882, but he would say that since the present bridge had been freed, the traffic had increased enormously, the omnibuses and all kinds of vehicles passing over it; therefore the traffic was very great, and the wear and tear would necessitate a considerable annual expense.

The report was adopted.

The following other recommendations of the Bridges Committee were adopted without discussion:—

That works of repair and painting be done to Wandsworth Bridge at an estimated cost of 5,000*l.*, the whole of the works to be included in one contract, and that an advertisement be issued inviting tenders for the execution of the works, such tenders to be opened at the last meeting of the Board before the recess.

That application be made to Parliament in the next session for powers to enable the Board to rebuild Deptford-creek Bridge, at an estimated cost of 20,000*l.*

That the necessary repairs to the supports of the roadway of Deptford-creek Bridge be forthwith carried out under a general contract at a cost not exceeding 200*l.*

The Bridges Committee also reported on the reference by the Board of the 9th of July, 1880 (No. 13), relative to the steps to be taken for carrying out the order of the Board as to the appointment of a person to act under the Engineer, to superintend the work that may be necessary to repair and maintain the bridges under the control of the Board; and recommending that Mr. Edward Bazalgette, assistant in the Engineer's department, be appointed, during the pleasure of the Board, as assistant engineer for metropolitan bridges over the Thames and its tributaries under the control of the Board, at a salary of 500*l.* per annum.

The recommendation was adopted.

CYPRUS.

SINCE Cyprus ceased to be a battle-field for party warfare little has been said about it, and the general public take little or no interest in the matter. We have before us the first report of her Majesty's High Commissioner, Major-General Biddulph, with various subsidiary reports, which all appear to show satisfactory progress. We condense a few observations from the first named:—

During the twelve months which succeeded the British occupation the rainfall in the great central plain, called the Messaria, was very small, and certainly did not exceed 6 in. The consequence was that the wheat and barley harvest of 1879 was exceedingly short. The prospects were so bad in the spring that the people held their corn, and large quantities were imported from foreign parts. The importance of an adequate rainfall in the Messaria may be shown by the fact that whereas the tithes of 1878 were sold for T.£. 82,000, over T.£. 42,000 of this sum was paid for the tithes of the five nahiehs, which are situated in the plain, leaving only T.£. 40,000 as the price of the eleven remaining nahiehs. During 1879 the tithes of Papho have largely exceeded the yield of the previous year, and the abnormal yield of carobs has removed all distress from the Limassol district; but notwithstanding this increase, the failure of the crops in the Messaria has caused the total net yield to fall to T.£. 45,000. This fact shows the importance of a good water supply; and when it is considered that irrigated land bears two crops annually, whereas non-irrigated land is only cultivated alternate years, and even then often fails, it cannot be doubted that a good system of irrigation would at least treble the production of the corn and cotton-growing lands.

In those places where there are perennial streams, the water is a frequent source of quarrelling and litigation amongst the people. Those who dwell near the source have no remorse as to wasting it, and thus curtailing the supply to those who live lower down. Very little attempt is made to store the rainfall in tanks, and where there is no natural source of water, no great effort has been made to supply the want by digging wells, except in the neighbourhood of villages for the personal wants of the inhabitants and the use of their gardens. Captain Inglis's report shows the necessity of something being done in the Famagusta district, where, at some seasons, the crops are destroyed by too much water, and at others by the want of it. It is a matter which is beset by considerable engineering difficulties; it is hoped that we shall be able to procure a scheme for overcoming them, by which not only will the prosperity of the people be increased, but also the health of the district be improved.

The failure of the harvest has caused great demand to be made for seed corn, and over 6,000*l.* have been spent by the Government for that purpose. It was the custom of the Turkish Government to lend seed corn to the people when needed, and they did it from the stores of tithe corn which they had collected. It may be doubted whether the policy of purchasing corn for that purpose is a good one, and whether it would not be better to meet the wants of those who are really needy, by remitting a portion of the taxes due from them, leaving them to use the money in the purchase of seed in the open market. But the question is an exceedingly difficult one.

The planting and preservation of trees has engaged the attention and care of this Government. Great pains have been taken to plant the eucalyptus, and considerable expense incurred for the purpose both by fencing it to preserve it from cattle, and owing to the necessity of its being constantly watered for the first two years. A large plantation at Famagusta has been entirely destroyed during the last few days by the excessive cold, which for intensity and duration has been unequalled at that place during the last forty years. With a view to encourage the importation of timber, and to save as much as possible the remaining forests, the import duties on all timber, whether manufactured or otherwise, and on all fuel of every description, has been entirely removed.

A considerable increase in the prosperity of the country may be anticipated from the opening up of roads. Upon our arrival here there was only one carriageable road in the island, viz., from Larnaca to Nicosia. No cart could pass from the central plain over the southern range of mountains by any other route, and none could pass at all over the northern range. A number of roads have been made fit for carts to travel on during the year 1879. A very great improvement in the wine may be looked for when the manufacturers cease to put it into tarred skins to convey it to the place of export; and the use of barrels will become practicable when roads are made. The road-making has also afforded much employment to the population; and I am informed that the poorer classes are much better off than formerly. The number of summonses for small debts has certainly greatly decreased in the courts; at the rate of no less than 40 per cent. in the Nicosia district during the last six months, notwithstanding the bad harvest.

The state of education in Cyprus must be considered to be at a low standard if judged by modern ideas. The majority of the agricultural population have received little or no education. In many villages not a single person can read or write, and the education of the women is almost entirely neglected. School statistics are being collected, and I hope shortly to be able to submit a report on this important subject. Meanwhile a great desire has been expressed by the inhabitants, both Christian and Mahometan, of the larger towns that the English Government should aid them in establishing good schools, and especially that the English language should be taught in them.

It is satisfactory to be able to say that the year 1879 has been extremely healthy. So much has been said and written with regard to the climate that it is only necessary to say that the year 1878 was, by all accounts, exceptionally unhealthy both to the English and to the natives of the island. The year 1879 was just the reverse, and although the more plentiful rain of the present winter augurs well for the harvest of 1880, the inhabitants confidently affirm that an abundant harvest will not this year be accompanied, as it often is, by an unhealthy season, as the extreme and unusual cold, such as has been experienced this winter, has always in previous cases been the forerunner of a healthy summer.

The Public Works Department has been entirely managed by officers of the Royal Engineers, and they have laboured hard at the necessary works, often with a very inadequate staff to assist them.

A Report by Lieut. Sinclair on the Public Works executed in the district of Larnaca gives some interesting information. After describing what has been done, the Report says,—

"New roads, the most important of engineering works, have already been mentioned. Next to them ranks irrigation. Any money spent on the execution of lines of wells for this purpose would be well repaid, but this is a matter for private rather than Government enterprise. The condition of the aqueduct supplying Larnaca with water has attracted serious attention. The aqueduct is at present thoroughly out of repair, and the water polluted before being delivered in the town. A scheme for remedying this great defect has been prepared, and the cost (3,000*l.*) provided for by the municipality of Larnaca; but unfortunately the rights vested in the heirs of the Pasha, who gave the aqueduct to the town, subject to certain restriction, have hitherto prevented the execution of this urgently needed work. The supply of water at the source is abundant and pure.

With regard to the general execution of public works in the district, it may be remarked that while some serious difficulties exist, there are other points which offer advantages not often to be met with. One difficulty and source of the expense is the want of tools and stores. Skilled labour would also have been difficult to obtain had not a large invasion of Maltese carpenters, smiths, masons, &c., occurred simultaneously with that of the English troops. Where roads do not exist, and the tracks are rough and steep, transport is a very costly item of expenditure. Donkeys, mules, bullocks, and camels of excellent quality, and in large numbers are, however, always forthcoming, and perform prodigies of strength and endurance. Wood is

very scarce and expensive, and its place in building is largely supplied by stone arches, in the construction of which the native masons are well skilled. Another difficulty, most serious to the engineer, is the total absence of any heavy rainfall since 1877. Engineering works, for want of experience of the possible rainfall and its action, have been reduced to works of theoretical calculation, where they should be the result of practical experience. The great advantage which we have in the execution of works in this country is the hardy, docile, and enduring qualities of the peasantry. Though at first lazy and dilatory, from their ancestral habits, they soon changed into diligent and active workmen, as they became accustomed to the use of pick and shovel, and the energetic superintendence of English overseers. They now accomplish a good day's task of nine working hours, in a manner that would put to the blush many an English navvy, subsisting almost entirely on black bread, olives, fruit, onions, and water, and perfectly content to work; the men at 9d. to 1s.; women (who are most industrious and hardy) at 9d.; and boys at 6d. Skilled native labour (masons and carpenters) may be had at 2s. to 3s. per diem. Maltese carpenters, masons, and smiths at 4s. A pony or mule can be hired at 2s. 6d. a day, a donkey at 1s. 6d. (with attendant), and a pair of bullocks, with a strong Arab or country cart, at 3s. 6d. These facilities have enabled me to perform large movements of earth (to give an example of the relative cost of work here and in England) at an average cost of 4½d. per cubic yard, which in England would cost, worked in the same manner, 1s. 9d."

SUN SYMBOLS.

A PAPER on "The Indian Swastika and its Western Counterparts," by Mr. Edward Thomas, F.R.S., has been reprinted in pamphlet form from the *Numismatic Chronicle*, and will be found interesting. Mr. Thomas says so many learned and enthusiastic scholars have attempted in times past to explain the origin and purport of the so-termed Mystic Cross, the counterpart of the Indian *Swastika* that it is with some diffidence that he now ventures to propose a more simple and less enigmatical solution of this much-discussed problem. As far as he has been able to trace or connect the various manifestations of this emblem, they one and all resolve themselves into the primitive conception of solar motion, which was intuitively associated with the rolling or wheel-like projection of the sun through the upper or visible arc of the heavens, as understood and accepted in the crude astronomy of the ancients. The earliest phase of astronomical science we are at present in a position to refer to, with the still extant aid of indigenous diagrams, is the Chaldæan. The representation of the sun in this system commences with a simple ring or outline circle, which is speedily advanced towards the impression of onward revolving motion by the insertion of a cross or four wheel-like spokes within the circumference of the normal ring. These crossbars are subsequently elaborated into new patterns and delineations, which will be noticed afterwards. As the original Chaldæan emblem of the sun was typified by a single ring, so the Indian mind adopted a similar definition, which remains to this day as the ostensible device or caste-mark of the modern *Sauras*, or sun-worshippers. The tendency of devotional exercises in India, indeed, seems from the first to have lain in the direction of mystic diagrams and crypto symbols, rather than in the production of personified statues of the gods, in which it must be confessed that, unlike the Greeks, the Hindus did not attain a very high style of art.

Mr. Thomas gives two plates of examples showing the development of the idea, and without reproducing these it is scarcely possible to give a complete account of his views. There are abundant examples of the primitive belief in the three positions of the sun: almost all the old pillars at Amarávati are ornamented with a triple *lotus* pattern, consisting of a semicircle or half-flower at the foot, in its uprising stage, succeeded by a central front-face flower, in the full maturity of the sun's emblem, surmounted on the capital by a duplicate half-flower reversed, the upper semicircle being omitted, which seems to denote the subsiding sun. In these instances, too, we find a remarkable exemplification of the hesitating or delayed disappearance of the after-glow in a pillar of a similar character in the Nassik caves, copied by Mr. West, where the fading light of the sun is exhibited in the form of a secondary or *retreated* repetition of the outline of the half-circle above the normal definition of the setting sun. One section of plate ii. is devoted to reproductions of Chaldæan and Assyrian forms of the sun, in order to exhibit their identities and contrasts with the symbols of the Indian system. Mr. Thomas has evidently devoted much time and learning to the investigation.

ART-UNION OF LONDON.

THE following are the remaining works selected by the principal prizeholders:—

From the Royal Academy.—In a Welsh Valley, F. W. Hulme, 150*l.*; Drawing Beer for the Gamekeeper, E. Opie, 50*l.*; A Hop-garden, A. Vesey, 50*l.*; Rhu More, Loch Alsh, Ross-shire, J. Nesbit, 45*l.*; A River Scene in North Wales, G. Wells, 45*l.*; The Firstling of the Flock, E. Newman Downard, 40*l.*; The Abbot's House, Malmesbury, F. H. Eastwood, 40*l.*; The Limpid Stream, A. De Breanski, 35*l.*; Edge of the Marsh, W. J. Slater, 30*l.*; Summer in Kent, J. L. Pickering, 21*l.*; Written Love, T. B. Kennington, 20*l.*

From the Society of British Artists.—Stitching Time, C. A. Smith, 45*l.*; Rivals, J. C. Waite, 45*l.*; In the Tyrol, Early Morning, W. Telbin, 42*l.*; A Misty Day, Birnam Beeches, H. Caffieri, 35*l.*; Just Caught, Thos. Earl, 30*l.*; A Frosty Day, near Shiplake Lock, on the Thames, W. Gosling, 30*l.*; An English Pastoral, A. Panton, 30*l.*; Fading Light, A. F. Grace, 25*l.*; Fading Day, Jno. Bromley, 20*l.*; Holly Bushes, Burnham, Bucks, H. Caffieri, 20*l.*; Waning Day, J. E. Grace, 20*l.*; Summer (marble bust), F. Junck, 20*l.*; Pasture Land, Essex, W. Luker, 20*l.*; "Begone, Dull Care," D. Passmore, 20*l.*; On the Edge of the Common, B. D. Symond, 20*l.*; St. Giovanni Paolo, Venice, Alfred Pollentine, 15*l.* 15*s.*; The *Lyc* Rock, Tintagel, Cornwall, A. B. Collier, 15*l.*; "The Lesson," Miss E. Gilbert, 15*l.*; "Anna" (Italian Girl), Jules Ravel, 15*l.*; A Calm Day in Venice, C. Thornley, 15*l.*; Winter Evening, G. A. Williams, 15*l.*

From the Crystal Palace Picture Gallery.—The Sledr Valley, N. Wales, J. Godet, 35*l.*; Evening, Coast of Cornwall, T. S. Croxford, 25*l.*; Fisher Children, L. Thomson, 25*l.*

From the Royal Albert Hall.—A Wiltshire Farmhouse, S. Lewis, 75*l.*; On the Torrent Walk, Dolgelly, R. Harwood, 50*l.*; Warwick Castle, W. C. Way, 45*l.*; The Thames from Richmond Hill, C. Potten, 35*l.*; Trumps Mill, Surrey, M. A. Langdale, 25*l.*

From the Society of Painters in Water-Colours.—Cornish Coast, Chas. Davidson, 25*l.*; St. Barnabas, Venice, Wm. Callow, 15*l.*

From the Institute of Painters in Water-Colours.—Coming Ashore, J. H. Mole, 47*l.* 5*s.*; On the Ghent Canal, near Ostend, W.W. May, 25*l.*; Monteleone, Southern Italy, Chas. Vacher, 25*l.*; View of the Meavy from Yelverton, South Devon, P. Mitchell, 20*l.*; An Old Forge in the Lake Country, H. C. Pidgeon, 15*l.*

From the Exhibition in Black and White.—Only a Penny, A. M. Rossi, 15*l.*

NEW CEMETERY AND CHAPELS, EVERTON.

THE Bishop of Liverpool (Dr. Ryle) has consecrated the Church of England portion of the new cemetery. It is fifty-four statute acres in extent, and the land cost 12,000*l.*, and the ground has been laid out and the chapels erected from the designs of Messrs. T. D. Barry & Son, architects, Liverpool, Mr. John Atkinson acting as clerk of the works.

Three chapels are provided,—one for the use of the Church of England, one for the use of Nonconformists, and another for the use of Roman Catholics. They are nearly alike in form, size, and arrangement, the principal difference being in the treatment of the towers. They contain in plan:—Nave 43 ft. 9 in. by 23 ft. 6 in.; chancel, 15 ft. 1 in. by 15 ft. 1 in.; vestry, 13 ft. 5 in. by 9 ft. 9 in.; aisle for coffins, screened off from the nave by an ornamental glazed screen, 21 ft. 6 in. by 16 ft. 3 in.; waiting-room, 18 ft. 8 in. by 15 ft. 1 in.; and tower at the front angle of the nave. Each vestry has a small yard, and under each vestry is a warming chamber, from which the chapels are warmed by a hot-water apparatus. The chapels for the Church of England and Nonconformist portions of the cemetery are placed on a terrace facing the entrance in Higher-lane; while the chapel for the Roman Catholic portion is near the other entrace in Long-lane. There are entrances to the chapels from the front of the nave and from the side of the tower, with an exit-door for the coffins without going through the chapel. The chapels are in the Gothic style of the Geometric period, which has been fully carried out in the character of its tracery, the richness of its mouldings, and the light and shade so characteristic of that period. The towers are 14 ft. 6 in. square and 50 ft. high, divided into three stages, the upper being a well-developed belfry. Above is a stone parapet with sunk and cusped panels, and the whole is surmounted by a spire 65 ft. high to the top of the vane. The treatment of the spires and pinnacles at the bases is different in each chapel. In the principal front of each nave is a four-light window, deeply moulded and filled in with rich tracery, the jambs and mullions having floriated caps and moulded bases. The end window of each chancel is of three lights, similar in character to those last described; and the side windows of each nave are also of similar style in two lights. The waiting-room windows are of two lights, in unison with the others. The windows throughout have received special attention, and their design, proportion, and workmanship assist in no small degree the successful effect of the chapels. The walls have been built with red sandstone, taken from a quarry within the cemetery, from which also a good deal of the dressed stone was taken, but the greater part of this work has been executed in red sandstone from quarries at Runcorn and Kirkdale. The chapels have been faced with stone parpoints, pitch-faced, squared, and coursed. The stone used internally in the arches, jambs, and columns of chancels and coffin-rooms is from the quarries at Quarella, near Bridgend, Glamorganshire, of a very delicate green stone colour, which contrasts well with the other stone. The walls are plastered internally. The whole of the roofs, benches, screens, and reading-desks are of the best pitch-pine, the roofs, which are open at the apex, being of hammer-beam construction, with circular ribs. Ample ventilation has been provided in the roofs by opening and closing shutters, additional ventilation being provided in the windows. The windows are glazed with toned rolled cathedral glass, of various colours, in geometric and floral patterns, which are very effective and in good keeping with the general design. The floors of passages of the naves and also those of the towers and coffin-rooms, are of tiles in ornamental patterns; those of the chancels are also of tiles of rich pattern. The slating is executed in Westmoreland green slates, with red ridges.

Within the grounds facing the central approach road is a building containing the offices of the Board. At the west side of these offices is an ornamental drinking-fountain, the gift of Mr. John Houlding, chairman of the Works Committee.

At the Higher-lane entrance suitable lodges have been erected for the superintendent and the gardener, and at the Long-lane entrance stands the registrar's lodge. The three lodges are in keeping with the general style of the other buildings. A stable-yard, with stabling for four horses, large coach-house, loft, &c., are also provided, besides a number of smaller buildings for implements, tools, potting plants, &c., and there is besides a large conservatory for rearing and propagating flowers. A yard is provided for executing masons' work, monuments, &c., under the direction of the Board. The back fences of the cemetery are of plain character, built from the red sandstone found on the site, and are no less than 2,500 yards in length.

The contractor for the whole of the surface work, drainage, road-making, fence-walls, chapels, lodges, offices, &c., is Mr. Isaac Anwell, of Liverpool. The conservatory was designed by Mr. Webster, of Wavertree, the heating being done by Mr. Kneale, and the ornamental ironwork, gates, and palisading by Messrs. Charles Smith & Co., Birmingham. The joiners' work has been done by Messrs. Nicholson & Ayre, Liverpool, and the slating by Mr. Jones, of Mount Pleasant, Liverpool. The trees, shrubs, and planting have been superintended by Messrs. Skirving & Son, Liverpool; the clock has been placed by Mr. Condliff, Liverpool; the drinking fountain by Mr. Pilling, Walton; the whole of the carving by Mr. John Clark, Liverpool; the heating of chapel by Messrs. Tessimond & Kissack, Liverpool; the water supply, fire-hose, and fittings, by Mr. Bucknall, Liverpool; the glazing by Messrs. Jelly & Hughes, Liverpool; the plumbing in the chapels is by Messrs. B. & J. Catlow, Liverpool; the tiling by Messrs. Chantrell & Son, Liverpool; and the fire-proof chamber, door fittings, and shelves, swing gates, &c., by Messrs. Bennett Brothers, Liverpool.

Exhibition of Gas and Electricity.—The Philosophical Society of Glasgow are arranging for an exhibition of apparatus for the utilisation of gas, electricity, &c., to be held in the Burnbank Drill-hall and grounds, Great Western-road, Glasgow, from Tuesday, the 28th of September, till Monday, the 25th of October. Some particulars will be found in our advertising columns.

APPROACHING CONGRESS OF THE SOCIAL SCIENCE ASSOCIATION.

THE following are the special questions in the departments more especially interesting to our readers to be discussed at the Edinburgh Congress, October 6th to 13th:—

Health Department.—1. What are the best areas for sanitary purposes, and how far should there be a revision of the mode of electing and continuing the services of the officers under the Public Health Acts?—2. What is the best mode of amending the present laws with reference to existing buildings, and also of improving their sanitary condition so as to render them more healthy, having due regard to economical considerations?—3. What are the means which should be adopted for the prevention of the pollution of streams, without undue interference with industrial operations, and for the preservation of pure sources of water supply?

Economy and Trade Department.—1. What legislative measures are required to leave the occupier of the soil freer than at present to increase his production of food; and by what measures of his own can the farmer best meet foreign competition?—2. What should be the course of legislation with regard to local government and the incidence of local taxation?—3. For purposes of taxation, what is the most scientific and practical definition of the word "income"?

Art Department.—1. Ought there to be a school of dramatic art subsidised by private subscription or endowment, or by the State?—2. How far would the revival of the old system of "Master and Pupils" be of advantage, and tend to promote the growth of historical art in the country, and the fitting use of painting and sculpture in our public buildings?—3. How can the musical education of the middle classes be improved?

SALE OF BUILDING SITE IN PARK-LANE, MAYFAIR.

ON Tuesday Messrs. Driver & Co. offered for sale at the Auction Mart, by direction of the Ecclesiastical Commissioners, a freehold building site in Park-lane, Mayfair, possessing a frontage of 93 ft. to Park-lane, and comprising an area of about 2,100 square feet. The site is close to Piccadilly, adjoining the residence of Sir William Miller, and is at present occupied by portions of the Rose and Crown public-house, three houses and shops in Park-lane, and the Park-lane entrance to Mercer's Horse Repository. It was explained in the particulars that the entire premises were leased for a long term of years, which expired last Lady-day, since which time they had been temporarily let (with the exception of the Park-lane entrance to Mercer's Horse Repository) at rents amounting in the whole to 425*l.* a year, with power of resuming possession at six months' notice from any quarter-day. It was added that as regarded the Park-lane entrance to Mercer's Repository, the purchaser could enclose or build upon it, being entitled to possession on completion of the purchase, and in that case the repository would no longer have an entrance from Park-lane. The auctioneer, in submitting the property, observed that he did not know what those present might consider it was worth, but his estimate was that it was worth from 8*l.* to 10*l.* per foot, which would give something like 20,000*l.* The biddings commenced with an offer of 10,000*l.*, after which there was a pause of several minutes, no advance being made, on which the auctioneer observed that if there was no further offer, the bid of 10,000*l.* would be both the first and the last, as the property would no longer remain on the vendors' hands, but sold for the sum which had been offered. After this intimation, the biddings were spiritedly resumed by advances of 50*l.* each, and the property was ultimately sold for 12,500*l.*

SALE OF MODERN BUILDINGS IN CHARTERHOUSE-STREET.

THE spacious and costly buildings recently erected in Charterhouse-street, between the Holborn Viaduct and Farringdon-street, known by the name of Ely House, were sold by auction, at the Mart, on Monday last, by Messrs. Furber, Price, & Furber, under an order of the Court of Chancery. The premises have a frontage to Charterhouse-street of 50 ft., the depth being about 122 ft., occupying a total area of 6,220 ft. They contain four lofty floors, and are erected with white Suffolk brick, and Portland stone dressings, the façade on the principal floor being ornamented by polished red and grey granite. The interior is arranged for subdivision, and contains several lofty show-rooms and suites of offices, the floor and mural decorations being elaborate and costly. The premises are held on lease from the Corporation for an unexpired term of seventy-five years from Christmas last, at the ground-rent of 536*l.* per annum, and are at present let on leases to several tenants, at a rental of 1,705*l.*, the owner paying rates, insurance, rectory stipend, and gas. The highest bid was 7,000*l.*, at which sum the auctioneer declared the property to be sold, after opening the document containing the amount fixed by the Court of Chancery. The opinion expressed in the sale-room was to the effect that the property was sold cheap, and that two years ago it would have realised something like 10,000*l.*

SALES OF BUILDING LAND AT HENDON, FINCHLEY, WILLESDEN, SUDBURY, LEYTON, AND FOREST GATE.

ON Friday, the 23rd inst., Messrs. Baker & Son offered for sale, at the Auction Mart, two freehold building estates in the parishes of Hendon and Finchley, possessing extensive frontages to the Finchley-road at Temple, Fortune, and other good roads, the whole comprising about 45 acres. The property was divided into six lots, varying from 3 acres to 10 acres each. Several of the lots were sold, realising about 600*l.* an acre. At the same time and place Messrs. Baker & Son also offered the Wembly Dairy Farm Estate, comprising about 100 acres of freehold land, situate at Stonebridge and Sudbury, in the parish of Harrow, and possessing nearly a mile of frontage to the Harrow-road. It was described as unusually well adapted for building purposes, for a resale in plots, or as affording fine sites for private residences and grounds. It was divided into thirteen lots, three of which were sold at about 250*l.* an acre. These were the first lot, containing 6 acres, sold for 1,500*l.*; and lots twelve and thirteen, containing 16 acres, and which were sold together, realising 4,100*l.*, the total proceeds of the sale amounting to 5,600*l.*

On Monday evening Messrs. Baker & Son offered, at the Victoria Tavern, Willesden-lane, Kilburn, sixty-one plots of freehold building land, fronting on Queen's-road, Harrow-road, forming the first portion of the West Stonebridge Estate, at Willesden, close to the Harrow-road Station of the Midland Railway, and to the Willesden Junction Station of the London and North Western Railway. A portion of the property was set apart for shops, the remainder of the plots being for small dwellings, for which it was stated there was a great demand in the district. With the exception of the shop-plots, which were larger, the several plots have a frontage of 16 ft., and an average depth of from 90 ft. to 100 ft. With two or three exceptions, the whole of the plots were sold, the shop-plots realising from 96*l.* to 100*l.* each, and those for private dwellings from 45*l.* to 50*l.* each.

On Monday evening Mr. F. M. Whittingham also sold, at the Swan Hotel, Stratford, thirty-eight plots of freehold building land at Leyton, having frontages to the high road and Huxley-road, and close to the Leyton Station of the Great Eastern Railway. The several plots have each a frontage of 20 ft., with a depth ranging from 50 ft. to 80 ft. The different plots realised about 2*l.* per foot frontage, and an aggregate sum of 1,391*l.* Mr. Whittingham next sold four plots of building-land on the Forest Gate Estate. They have a frontage of 25 ft. each, with a depth of 195 ft. Each lot was sold for 126*l.* realising an aggregate sum of 504*l.*

BUSINESS PREMISES.

THE new premises taken by Mr. J. W. Benson for the extension of his present steam-factory and shops in Ludgate-hill are those lately occupied by the Prudential Assurance Company, Nos. 62 and 64, Ludgate-hill. To meet the necessary requirements, the two buildings have been re-arranged to form one, the alterations, including some very heavy underpinning of the whole of the two structures, being carried out by the builders, Messrs. Patman & Fotheringham, under the directions of Mr. C. J. Phipps, F.S.A., architect. The whole of the shop-front and window-fittings formed a separate contract, which has been executed by Messrs. Clark & Co., of Rathbone-place, from designs of the architect. The frontage, 40 ft. in length, by placing the entrance in the centre, gives two large windows of three bays each for display of Messrs. Benson's specialities. In the construction of the shop-front are several novelties. As a rule, London shop-fronts, with the windows made either in mahogany or soft wood stained black of the stereotyped form, show in great contrast to the Continental store or *magasin* in Paris. The well-known Bazaar du Voyage facing the new Opera-house, for example, is constructed in polished marble,—a material which, with but few exceptions, is unused in London. Here, in the present case, the architect has selected and used some very beautiful specimens of Devonshire marble for the pilasters and columns forming the entrance to the shop. The shafts for these columns are in one length of 10 ft., with moulded bases of dark green marble from Irish quarries. The capitals and enriched bands are some good specimens of bronzed metal-work, and show in strong relief. The window-cills are also of polished Devonshire marble to match the columns and pilasters, while the sashes are formed by cast-iron fluted columns with cast-iron moulded arches, which are filled in with marble panels, on which are carved specimens of flowers and foliage, partly gilded. The floor of the entrance to the shop is paved with white Sicilian marble; and, instead of the ordinary plain soffit, the lobby ceiling is domed, with groins executed in mahogany. The side-windows, formed with moulded arches, are made to receive the astronomical clocks and calendars. The window-casings are in polished mahogany, partly hung and partly sliding, fitted with specially-constructed lighting and ventilating apparatus, the temperature being maintained in an ingenious manner, suggested by Sir H. Bessemer. The shop-front is closed with seven of Clark's patent noiseless self-coiling steel shutters. Their patent self-rolling sunblinds are also fitted to the building. The work has been executed with great rapidity.

CURIOUS DEFENCE TO AN ACTION.

ARCHITECT OR BUILDER?

LAST week, at the Lambeth County Court, Mr. Stevens, an architect and surveyor, of Brixton, brought an action against Mr. Holland for the sum of 5*l.* 18*s.* 6*d.* for professional services rendered. The original defendant was Mrs. Rogers, a widow, but had recently married the present defendant. The plaintiff's case was that he was instructed by Mrs. Rogers to prepare plans for the extension of the Minerva Collar Factory, Charlotte-row, Walworth, and for the alteration of certain houses in Clapham, at different periods; and these instructions he carried out, and having done so, he could not obtain payment. In answer to the claim, the defendant said he was instructed by his wife to state that the plaintiff was a builder and not an architect, and that she had given him an order to build two houses for her in conjunction with a Mr. Hopkinson. Under these circumstances the defendant said he did not think he had any right to pay for the preparation of the plans for which the plaintiff claimed. In reply to this the plaintiff explained that the defendant was referring to a different person altogether. There happened to be a Mr. Stevens, a carpenter, who once resided near his office, and Mrs. Holland had confused the two. His honour characterised the defence as not very creditable, and gave judgment for the full amount claimed, with costs.

LOCAL BOARDS AND OWNERS OF PROPERTY.

THE TOTTENHAM LOCAL BOARD OF HEALTH *v.* ROWELL.

THIS was an appeal (in the Court of Appeal), on July 24th, before Lords Justices James, Brett, and Cotton, from a decision of Vice-Chancellor Malins. The action was brought by the Tottenham Local Board to enforce a charge upon the property of the defendant for 25*l.*, and interest from February, 1873, the amount of a rate levied upon the inhabitants under the powers of the Local Government Act for the plaintiffs providing sewers and repairing the roads and footways.

The works were done in the year 1865, but the expenses incurred by the Board were not, until the 31st of January, 1873, duly apportioned by the surveyor of the Board, and the demand for payment of the assessment was made in the following month. The objection raised by the defendant was on the ground that the mode of recovering payment, as directed by the various Acts of Parliament, was in the first instance by personal action, by summary proceedings before the justices, or in the County Court within six months, and no such proceedings having been taken to recover the money, the plaintiffs were precluded by lapse of time and unjustifiable delay from now coming to this Court to enforce a charge on the land. The Vice-Chancellor decided that the power to charge the land of a defaulting ratepayer under those Acts was subsidiary to the other summary proceedings specified in the Acts, and that the Board, not having taken any of those proceedings within six months, were precluded, after a lapse of so many years, from claiming a charge upon the land. The action was, therefore, dismissed with costs.

Their lordships, after great fluctuation of opinion,

came to the conclusion that the expenses incurred by the Board under the powers of their Act for works done in providing sewers and repairing the roads and footways were capable of being made an independent charge on the property improved, and such charge might be enforced even after the summary remedy against the owner and occupier was lost. The power to enforce the charge was not forfeited by lapse of time. The effect of deciding against the plaintiffs would be to throw all these expenses upon the general rates instead of upon the owners of property facing the improvements. Their lordships could not agree with the decision of the Vice-Chancellor, and the appeal must be allowed.

IS A ROAD A STREET?

MAYOR OF ACCRINGTON *v.* NUTTER.

THIS was a case in the House of Lords, which involved an important question under the Public Health Act, 1848.

In the year 1871 the appellants raised the level of a road in Accrington, which was subject to a turnpike trust, and in so doing damaged the respondent's house, which abutted on the road. The question raised by the present appeal was whether the appellants were liable to pay damages to the respondent for the injury done to his house. The Court of Appeal held the defendant liable, on the ground that the road in question was a "street" within the meaning of Section 68 of the Public Health Act, 1848, and as such was vested in the appellants.

The case was argued some weeks since, when their lordships took time to consider their judgment.

Lord Penzance was of opinion that the Court of Appeal was right. It was quite possible for a turnpike-road near a town to become a street, and there was no reason why the provisions of the Public Health Act, 1848, should not apply to such a street.

Lord Blackburn also thought the judgment should be affirmed. Looking to the sanitary objects of the Act, there was quite as much reason for vesting in a local Board a road which was subject to a turnpike trust as one that was not. The street in question was, in his opinion, vested in the appellants by Section 68, and they were, therefore, liable for the damage done to the respondent's house.

Lord Watson and the Lord Chancellor concurring, the appeal was dismissed with costs.

LAMBETH PALACE LIBRARY.

NEW REGULATIONS.

THE following regulations have been approved by the Ecclesiastical Commissioners, in pursuance of an order in Council, June, 1880:—

1. With the exception of the periods named in Regulation No. 2, the library is open to the public on Mondays, Wednesdays, Thursdays, and Fridays, from ten a.m. to four p.m.,—during the forenoon of Tuesdays, throughout the year, and from April to July (both months inclusive), until five p.m.

2. The library is closed during the week commencing with Easter Day, and during seven days computed from Christmas Day, and for a period of six weeks from about the 1st day of September in every year.

3. Extracts from the MSS. or printed books are allowed to be made freely, but in case of a transcript being desired of a whole MS. or printed book, the consent of the Archbishop must be previously obtained.

4. Permission to copy illuminated MSS. and rare engravings can only be obtained on submission of the applicant's name to the Archbishop.

5. MSS. are only lent out by an order signed by the Archbishop, and with a bond of 50*l.* or 100*l.* for their return within six months or on demand.

Rules for Lending Books.

6. Except under special permission, the loan of books will be restricted to the clergy and laity of the diocese of Canterbury, and to persons residing within the parish of Lambeth, the borough of Southwark, and the city and liberties of Westminster.

7. All applications for the loan of books must be countersigned by a beneficed clergyman, who must certify to his personal knowledge of the applicant.

8. Every one desirous to borrow must obtain from the librarian the prescribed forms, and all applications for the removal of books must be made to the librarian in person, or by some trustworthy representative, authorised in writing by the applicant, to receive them. . . .

11. Works of reference, books of prints, works of an earlier date than 1600 A.D., pamphlets, and such books as in the discretion of the librarian cannot easily be replaced, can only be consulted in the library.

ARCHITECT AND CONTRACTOR.

SIR,—Your correspondent "B's" narrative of his sufferings would be distressing but that I feel sure, if he were properly advised, a means would be found to extricate him from his difficulties, or prove him to be in error.

As it is purely a matter of the failure of a Portland cement concrete, and as his case furthermore greatly resembles one on which I was consulted only a short time back, I may, perhaps, be allowed to offer some remarks.

The legal wording of the specification and the contract must, as you very justly say, have considerable effect in determining the verdict, but, in equity, it is simply ridiculous to say that Mr. C. has the power to condemn good work executed with good material; for, if such were the case, an architect could ruin every contractor who worked under him, no matter how honestly the work was done, and the contractor would have no redress. The architect furthermore would not without reason give himself the extra labour which such proceedings would inevitably entail. It must therefore be assumed that the floor as laid by B was faulty, or Mr. C. could have had no object in condemning it. But Mr. C. may, perhaps, have been in error in asserting that the failure was due to an admixture of lime with the cement, and on this error B may be attempting to make out his case.

Bad cement, bad sand, bad water, bad workmanship, are only a tithe of the causes to which the failure of the concrete may be due; and I think B would have acted more wisely if he had, as you suggest, obtained good legal and expert advice, instead of attempting to secure sympathy by only half stating his case in your valuable journal.

HENRY FAIJA, Assoc.-M. Inst. C.E.

PAYMENT FOR QUANTITIES BY BUILDERS.

SIR,—I very carefully read the letter in your issue of a few weeks since (p. 57, *ante*) under the above heading, but cannot see that the writer advanced anything new. Almost all architects and builders agree that quantities should be supplied for all but very small buildings, and the general run of builders would regard with dismay the proposal that quantities should be taken off in the office of the architect instead of by an experienced surveyor who is constantly engaged in the work. As regards the use of the papyrograph or any other modern invention, I may state that I have tried several, and proved that they cannot be compared with good lithography for clearness and correctness, while the actual cost of lithography is really not great, even including the printer's large profit; but the amount in the summary is often increased to include something for the architect, instead of the amount put down* "for copies of drawings, &c.," so many pounds.

Taking off quantities is really hard work, and not so well paid for as people imagine, very few surveyors getting more than 1 or 1½ per cent. to cover time and expenses, after handing over to the architect his share of the commission;* and this amount may be still further reduced if the surveyor is obliged to pay the architect's managing clerk some small commission, which appears to be the case in some instances, as reported on page 57 of your issue of the 10th inst. The case referred to, "Wyatt *v.* Batstone," ought certainly to have been settled out of court, or, in plain words, the soiled linen washed at home.

OBSERVER.

HISTORY OF STAINED GLASS.

SIR,—I have to thank you for a very interesting and painstaking criticism of the "History of Design in Painted Glass." May I ask permission to explain in your columns my meaning more fully upon a few points?

In answer to your remark, "He speaks with great admiration of figure-designs which . . . . would not (ordinarily speaking) excite admiration." My admiration of them is great, only when considering the conditions of their production. One admires them as works of their period, and as designs for a new and difficult material, not as compared with such works as those produced in other arts and in other periods by Phidias or by Raffaelle. When I speak of their dignity, my intention is to use the phrase somewhat in the sense implied by the reviewer in his concluding remarks. This feeling of dignity is irrespective of the drawing as drawing, but it is evident that the artist approached his work with reverence for it and for his subject, without levity and without the intention of "knocking it off." My remarks imply that before the year 1,400, and that is the perfect advent of the Decorated style, the levity and facility shown in late thirteenth-century work did not produce any better drawing.

Regarding the example of the head from Lincoln, quoted by your reviewer as of a very fine type, I quite agree with him; then this is, we may suppose, of about the year 1220 A.D., and long before 1400.

Concerning "pot metal" and "enamel," I use the first term to include all metals coloured in the pot, and I include ruby because the "flash" upon it is of such consistency and durability that it may well rank with them. By "enamels" are meant coloured or opaque pigments, mixed with a flux, and burned upon or into the surface of the glass. I am unaware of any old glass called "enamelled," having colours upon its surface which have not been burned.

N. H. J. WESTLAKE.

P.S. The mosaic ornament and grisaille patterns which your reviewer desiderates are treated of in the third part, which is in the press.

* We must hold the writer of this letter responsible for proof of this statement if questioned.

STAINED GLASS.

Gloucester.—Messrs. Camm, Brothers, of Birmingham, have lately fixed a stained window in St. John's Church, Gloucester. The window is in the Italian style, the centre light having for its subject "Christ blessing little children." The Saviour, in the midst of a group, and having taken a child upon his lap, is in the act of blessing a girl kneeling before him. In the background are several of the apostles. The two side-lights have, on the left, the "Nativity," with the emblems of the time and place, the star, ox, and ass, in the background. The Virgin Mary is seated with the "Holy Babe," while Joseph meditates upon the scene. On the right is portrayed the Baptism of the Saviour in the River Jordan. The window, it should be stated, is in memory of Robert Raikes and the Rev. Thomas Stock, both of Gloucester.

Cambridge.—The large east window of Corpus Christi College Chapel, Cambridge, has just been filled with stained glass. The subject represented is our Lord's Crucifixion, occupying the whole of the window, and the work was designed and executed by Messrs. Heaton, Butler, & Bayne, of Garrick-street, London.

Winchester.—The windows of the County Hall are now all filled with stained glass illustrating incidents in the history of the city. The windows are by Messrs. Hardman, of Birmingham, and are arranged heraldically, so as to perpetuate and illustrate the memories of county notables, who range from the mystic Arthur down to the worthy Hampshire man of Stuart times, Chaloner Chute, of the Vine. The design and decoration of the hall will be a memorial alike of the worthies thus recorded in armorial blazon and of the antiquarian erudition of Mr. Melville Portal, who has found time amidst cares of county administration to arrange this decorative work, and prepare a book on "Hampshire Worthies," which will, it is stated, soon see the light. The window which completes the series has lately been completed. It may be called the Restoration window, for the chief shields are those of the leaders who joined heartily in the Restoration. The quatrefoil head has the crowned head of Charles II., and the shields are arranged in the following order:—That of James I. stands first, and that of Lancelot Andrewes, bishop of the diocese, stands next in order. The shield of Charles I. follows. The shields of Sir Wm. Ogle, John Paulet, of Basing House memory, and Chaloner Chute, Speaker of the House of Commons during the Commonwealth, recall various scenes in those troublous times of the Commonwealth, of the close of which we are reminded by the shield of Richard Cromwell. The shield of Anthony Ashley Cooper, Earl of Shaftesbury, commemorates one of the illustrious men who aided Charles II. with advice on his return from Holland, and who was one of the famous Cabal ministry. The last shield enshrines the memory of Thomas Ken, Bishop of Bath and Wells, whose "Evening Hymn" is so well known.

DRINKING FOUNTAINS.

St. Paul's Churchyard.—The fountain which Messrs. John Freeman & Sons are preparing for erection in St. Paul's-churchyard will (says the *City Press*) be an octagon in plan, 20 ft. diameter, standing upon a circular raised platform of two steps, 34 ft. in diameter. On four sides of the octagon basin there will be shell-shaped drinking-fountains. The water will be thrown into a centre tazza from four bronze lions' heads, and thence will flow into the large octagon basin. The whole work, which is from the designs of Mr. F. C. Penrose, architect to the Dean and Chapter, will be formed of granite from the Lamorna quarries of Messrs. Freeman, the exposed surfaces being polished. Messrs. Freeman's quarries, which are situated in Cornwall and Devon, give employment to about 1,000 men, and produce blocks of great magnitude.

Winchester.—The new drinking-fountain out-

side Westgate is nearly completed. The donor is Mr. Lancelot Littlehales, and the carver and mason is Mr. S. Newman. Mr. S. J. Newman, of Northampton, is the architect.

BUILDERS' BENEVOLENT INSTITUTION.

THE thirty-third annual meeting of this Institution was held at Willis's Rooms, St. James's, on Thursday afternoon, the president, Mr. F. J. Dove, in the chair.

The report for the past year stated that if means should be found to make an addition to the annuities now given [30*l.* to men and 24*l.* to women], the comfort of the pensioners (many of whom had no other means whatever) would be materially promoted. The committee had confidence that increased funds would be supplied by the powerful interest which the Institution represented, if it were decided to increase the pensions. The committee express their thanks to Mr. F. W. Keeble, the hon. secretary of the annual ball, and to the stewards who assisted him, in making that gathering a success, and warmly acknowledge their indebtedness to Mr. F. J. Dove, the retiring president, for the energetic manner in which he has served the Institution during the past year. During the year ten pensioners [an exceptionally large number] have been elected on the funds of the Institution, and two widows of pensioners have been added to the list without election. Seven pensioners died during the year.

The balance-sheet (audited by Messrs. J. H. Hunter, J. Cruttenden, and R. J. Ward) showed the receipts to be 3,221*l.* 19*s.* 2*d.* (including 846*l.* 10*s.* 7*d.* balance brought forward from last year). The annual subscriptions amounted to 786*l.* 10*s.*; the donations to 861*l.* 12*s.*; the dividends on funded property to 632*l.* 7*s.* 5*d.*; and the profit on the ball was 94*l.* 19*s.* 2*d.* The expenditure included 1,346*l.* 6*s.* 6*d.* paid to pensioners; and the burial-money for pensioners, 35*l.* 1*s.* 6*d.* After deducting expenses of management, there remained a balance of 788*l.* 1*s.* 4*d.* at the bankers'.

On the motion of Mr. George Plucknett, seconded by Mr. Richard Head, it was resolved, after considerable discussion, to increase the pensions of the men to 39*l.* a year, and those of the women to 27*l.* a year. It was stated that there were now twenty-two men and thirty-one women receiving annuities from the Institution, and that the committee hoped in a few years' time to increase the amount of the pensions to 50*l.* per annum for the men, and 30*l.* per annum for the women. To enable them to do this, increased subscriptions would be needed. In connexion with this point it was announced that Mr. George Godwin had offered to subscribe 10*l.* a year for ten years if nineteen other persons could be found to do the same thing, so as to increase the income of the Institution by 200*l.* a year during the next ten years. Thanks were voted for the offer, and the hope was expressed that it would be responded to.

It was resolved to alter section 2 of Rule III., so as to allow applicants for pensions to be in receipt of an income of 50*l.* per annum [independently of the amount of the pension], instead of 30*l.* as at present.

The report and balance-sheet were adopted, and votes of thanks were accorded to the President for the efficient way in which he had performed the duties of his office during the past year; to the vice-presidents; to the trustees (Mr. George Plucknett, Sir S. Morton Peto, Alderman Sir J. C. Lawrence, M.P., and Mr. C. T. Lucas); to the committee; to the auditors; and to the honorary solicitors.

The Treasurer (Mr. George Plucknett) was re-elected, as were the members of the committee who retired by rotation, and the auditors. Mr. Howard Colls was also elected a member of the committee.

Mr. Thomas F. Rider was unanimously elected President of the Institution for the ensuing year, and it was announced that under his presidency the annual dinner will be held at the Freemasons' Tavern on Thursday, November 11th.

Sir Thomas Bouch.—The solicitors of Sir Thomas Bouch, the designer of the Tay Bridge, have obtained from Col. Yolland and Mr. Barlow, two of the members of the court of inquiry, a statement that Mr. Rothery was not warranted in representing their opinions as concurring with his own in matters not referred to in their report.

EXCURSION BY THE ARCHITECTURAL ASSOCIATION.

IT has been decided to visit some of the cities in the plain of Lombardy, for study, this autumn. This district, being a clay country, is rich in terra-cotta work, as well as in stone and marble structures. It contains many interesting churches by Bramante and others. Also mural decoration of all periods. It is proposed to devote the latter half of September to the excursion, leaving London on the 15th. Each gentleman will be expected to draw the particular work arranged and allotted to him by the secretary. By this subdivision a large mass of information will be collected. The itinerary includes Turin, Milan, Bergamo, Brescia, Cremona, Mantua, Pavia, and Certosa.

PITCH PINE.

SIR,—Will you please to insert the following? Upon suggesting the use of pitch pine for window-cills to a well-known builder, whose houses are always carried out in a first-class manner, he sends me this reply:—

"I once had a very high estimate of pitch pine, but lately, from what I have seen, my opinion of it is wholly changed. I believe, myself, that yellow deal cills will in the end be found more enduring by very many years. Pitch pine, kept dry, is perhaps an enduring wood (I have grave doubts even as to that), but between wind and weather I think it is almost the worst wood a builder has to use."

I should like to know what other members of the profession can say about it.

AN ARCHITECT.

BRICKMAKING.

SIR,—Can any of your readers tell me of a good book on Brickmaking, which gives good and trustworthy information about the process, machines, &c.? I have a book by E. Dobson, but it is thirty years old, and, therefore, of very little use.

BRICKMAKER.

CHURCH-BUILDING NEWS.

Bermondsey.—The new Church of St. Crispin, Southwark Park-road, was consecrated on the 6th inst. by the Bishop of Rochester. The edifice has cost, inclusive of purchase of site, building of parsonage, and an endowment of 5,000*l.*, something like 16,000*l.*, of which sum Major-General Sir F. Fitzwygram and his family subscribed 11,500*l.* The building's chief external characteristic is its evident substantiality, but the interior is not without features of architectural beauty. The style is Gothic, and the material red brick and stone dressings. Inside, the walls have red brick facings, and the stone piers and arches stand out in bold relief on both sides of the building. Seating accommodation has been erected for 600 worshippers, the seats being composed of deal, stained and varnished. The windows are glazed with cathedral glass of varied hues, and the ceiling and chancel are groined in wood. For the rest, it may be stated that the reredos is formed of Caen stone, and the tablets behind the altar, which is plain, are of gilded copper plates. The organ is by Walker, and there are two vestries,—one for the use of the clergy, and the other for the choir. The tower and spire remain to be completed, at an estimated cost of 900*l.* Mr. W. Shephard, of Bermondsey New-road, is the builder, Messrs. Coe & Robinson, of Furnival's Inn, being the architects.

Dartmouth.—A parish meeting has been held at Dartmouth for the purpose of considering two schemes for the repair and improvement of St. Saviour's Church, which has been permitted to lapse into a state of dilapidation. Mr. Thomas Lidstone, diocesan surveyor, presented a report, and estimated the carrying out of the necessary work at 4,356*l.* Plans were also presented by Mr. Edward Ashworth, of Exeter, with an estimate of 3,878*l.* Mr. Lidstone, having been requested to examine and report upon the condition of the fabric, stated that the walls and much of the timber of the structure were sound, but thorough repair was necessary throughout the church, the windows, roof, walls, ceiling, seats, warming and lighting apparatus, tower, and bells especially requiring improvement and alteration, whilst a new vestry was needed. The galleries and churchyard would not be dealt with at present. Mr. Ashworth proposed, according to his plans, to clear away the west gallery, and all the cradlework that runs up from the westward, to place the organ in the north chancel aisle, to restore the roofs and tower, to reseat the church, to renew the windows, to provide hot-water heating apparatus, to re-light the church, and to remove the altar-piece to the west end of the church against the northern wall, and to substitute for it a reredos. The meeting resolved to carry out the work in accordance with Mr. Ashworth's plans, which, however, that gentleman wrote to say would cost 200*l.* more than he had at first stated.

Salcombe.—A meeting of the parishioners of Salcombe, Devon, has been held to consider the question of the enlargement of the church, which was built thirty-seven years ago. The matter was placed in the hands of Mr. J. D. Sedding, of London, who had prepared plans which provided for the execution of the work in three sections. The first part was the adding of chancel and vestries, the second adding to the western end, and the third the adding of a north chancel aisle, with a gallery over for the children. If the whole scheme be carried out the church will be capable of seating 600 people. If it were found impossible to carry it out all at once, the church could be first extended in an easterly direction by the erection of a chancel and north transept, which would give an addition of thirty-one sittings, whilst a gallery over would accommodate seventy-two children. If the church were extended in a westerly direction sixty-one sittings could be added. There were 266 sittings at present, and if the plan was carried out in its entirety it would give 370. It was resolved to take means to carry out the plans laid before the meeting. The cost of the proposed works is estimated at from 2,000*l.* to 2,500*l.*

Nuthurst.—The Bishop of Worcester has lately consecrated St. Thomas's church, which has been erected in the new parish of Nuthurst, cum-Hockley Heath, near Knowle. The site for the church was given by the Rev. T. J. Morris, the Vicar of Hampton-in-Arden, who has also provided a piece of land upon which to erect a parsonage. The total cost of the church, exclusive of the site, has been about 2,200*l.* The church comprises a nave 53 ft. long by 24 ft. 9 in. wide, a well-proportioned chancel, a south porch, an organ-chamber and choir vestry also on the south side, the heating-chamber being situated beneath the vestry. A tower, crowned with a belfry and spire, rises at the angle formed by the nave and chancel on the north side. The steeple, from the ground to the weathercock which surmounts the final stone, is 81 ft. 6 in. high.

VARIORUM.

"SCIENCE FOR ALL," for August, says:—"Any one passing not long ago along the main street of a busy town in the West Riding of Yorkshire, might have observed a very curious fact,—the lower halves of several large plate-glass windows were rent from side to side. A single glance was sufficient to show that the cracks were not produced by the stray missiles of certain street Arabs, for they had not that radiating or star-like arrangement which is generally seen in such cases, but, instead, consisted of one large rent proceeding from one side to the other, with one or two minor cracks branching therefrom. To account for this curious and highly inconvenient phenomenon was a sore puzzle to many of the good folks about; some there were, however, more knowing than the rest, who arrived at a sensible and satisfactory explanation, thereby proving what is perhaps demonstrated every day, nay, every hour,—that science is only, to use the words of Huxley, trained and organised common sense. It was midsummer. The windows of the shops where these cracks were to be seen faced the south, and were therefore exposed to the full glare of the sun's light and heat. The lower halves of the windows,—*i.e.*, the cracked parts,—were painted, on the inside, of a dun colour, and by two in the afternoon had become quite hot to the touch, whereas the upper and unpainted halves were only slightly warmed. Herein lay the secret. The glazier fixed the windows as if they had been small panes, where the amount of expansion is very minute indeed, and they were fixed in a rigid framework that would not give way. The painter, on his part, in his ignorance of certain principles, put on a colour which led to the glass being strongly heated in the sun's rays. This followed: the plate-glass was heated, and it expanded; the frame of the

window tried to resist that expansion, and in the struggle the weaker had to give way, not doing so, however, until it was irremediably injured."——"Picturesque Europe" says a word about the Town-hall of Ypres:—"It is certainly one of the architectural wonders of the world, with the vast roof, the enormous length, the tower of vast bulk, the rich details of the arches, the air of solemn decay. And all this is contrasted with the sort of little obscure country town in the centre of which it rises. We wonder how it is that such a monument could be found in such a place, and look up to it with a sense of awe and mystery. It alone is worth a pilgrimage from London. Yet the average traveller, guide-book in hand, hurries by to see the regular catalogued shows, which are not so nearly worth his attention. But this is too often the case. Thus, within ten miles' walk of Ostend, is a little fortified town, Nieuport, lying in a rich champagne country, with its fosse, and walls, and gates, in which there is a gem of a little town, all decayed and rusted, and a strange old church with a remarkably picturesque tower, the combination infinitely beautiful in itself, and giving a sense of gratification the more welcome because it is unexpected; yet few know of Nieuport, and in the guide-books it is dismissed with an unappreciative line or two. All the 'sights' are for those who 'run' along the beaten track, and who have barely time to read as they run."——"The Technical Educator," for the coming month, gives some hints on carpet patterns:—"Carpet patterns may with advantage have a geometrical formation, for this gives to the mind an idea of order or arrangement. When the pattern has not a geometrical basis, a general evenness of surface should be preserved. Carpets are better not formed into 'panels,' as though they were works of wood or stone, but should have a general 'all over' effect, without any great accentuation of particular parts. The Indian and Persian carpets meet this requirement. While a carpet should present a general appearance of evenness, parts may yet be slightly 'pronounced,' or emphasied, so as to give to the mind the idea of centres from which the pattern radiates. A carpet should, in some respects, resemble a bank richly covered with flowers; thus, when seen from a distance, the effect should be that of a general 'bloom' of colour. When viewed from a nearer point it should present certain features of somewhat special interest; and when looked at closely new beauties should make their appearance. As a floor is a flat surface, no ornamental covering placed on it should make it appear otherwise. A carpet, having to serve as a background to furniture, should be of a somewhat neutral character. Every carpet, however small, should have a border, which is as necessary to it as a frame is to a picture."

Miscellanea.

New Artisans' Dwellings Schemes.—At the last meeting of the Metropolitan Board of Works, the Works and General Purposes Committee reported that, having regard to the improvements remaining to be carried out under the provisions of the Metropolitan Street Improvements Act, 1877, and in connexion with the several artisans' dwellings schemes, it is not, in the opinion of this committee, desirable that any application should be made to Parliament in the next Session for powers to undertake additional street improvements; but that this opinion does not apply to any application which may be necessary for the widening of any portion of the Victoria Embankment; and recommending that the following Vestries and District Boards who have applied for the carrying out of street improvements be informed accordingly, viz., the Strand District Board, the Vestry of Clerkenwell, the Vestry of Islington, the Vestry of Newington, the Holborn District Board, the Vestry of Bermondsey, the Limehouse District Board. Mr. E. Dresser-Rogers moved the adoption of the report, and observed that the committee had been very carefully into the question, and he thought the Board would agree that, when there are so many great improvements now in hand, it would be inadvisable to go to Parliament with further schemes. The question had been carefully gone into by the committee, and the proposed improvements did not press. The report was adopted.

Land Drainage.—Mr. Mechi strongly recommends drain-ventilation. The late Josiah Parkes used to have bricked recesses or boxes at intervals, into which the inch-pipe discharged the water, the outlet-pipe being 3 in. below it, so that air was always present, and the flow more rapid through these small conduits; the vent or air-pipe was thus always open. Some years after I drained my land, Mr. Mechi says, the outlets which opened into the open ditches were led into a larger pipe or receiver, and the ditches filled up. The drains became gradually less active, and we ascertained that it arose from the air not passing into the mouths of the drains so freely as it used to do. I remember a singular instance of benefit derived from having ventilating openings at the beginning as well as at the end of the drains. It was recorded in print that no rain had fallen until some time after the field had been drained, but nevertheless the crop was wonderfully improved, and it was attributed, very justly, to the drying of the soil by subterranean aëration. The engineer who effected this always admitted air at both ends of the pipes. How wrong it is to allow vegetation to accumulate around or over the outlet, and thus impede free circulation of air. This is why I strongly recommend iron pipes as outlets, 6 ft. or 9 ft. long, most of their length being firmly imbedded in the soil; their outside nozzles projecting are undisturbable. Is is a great economy, because of its immobility and indestructibility. Earthen and brick outlets are frequently injured or overgrown, and the drainage spoiled.

The "Chalet" Company, Limited.—This company, which has been formed for providing public lavatories, retiring-rooms, and toilet accommodation in the thoroughfares, squares, parks, gardens, and other open spaces of the metropolis, and of the chief towns and cities throughout the United Kingdom, of an ornamental character, in the form of a Swiss châlet, is now taking shape. The châlet is constructed of iron, wood, and brick, and unobjectionable in appearance. The dimensions are necessarily subject to modification according to the site available. The lower portion is a framework of wood panelled to an elevation of 6 ft., above which, encircling the entire structure, are arranged glass panels of varied colours. For years past the urgent necessity for such places of convenience has been admitted by all classes, and the time has now come when this problem is to be practically solved by the present enterprise, which, instead of dipping into the ratepayers' pockets, will actually yield a revenue to the parish and at the same time leave the official mind entirely free from all embarrassment and responsibility of organisation and management. There is abundant testimony from medical men and others to prove that the want is not imaginary, but that it is really a great and growing one, which calls for the prompt and careful consideration of those whose business it is to make provision for it.

"Male Cork" Facings for Damp Walls.—The lightness and isolating properties of ordinary cork are well known; but, according to the *Echo Forestier*, people are less acquainted with the male cork (*liége mâle*), which is the first formed about the tree, and which has been little used on account of its innumerable rugosties. It is, however, well adapted for the facing of damp walls, on which it should be nailed, so that the rough face is always outwards; plaster is then added on this side. This treatment has given excellent results, and it has been possible to paint or paper walls so treated, the dampness of which had previously been combated in vain. It is suggested that the comparatively low price of these facings, together with their advantages, ought to lead to an innovation which would result in the utilisation of much material now wasted, and the extension of the plantation of cork oaks in Algeria and other regions where the destruction of forests proceeds at present with alarming rapidity.

New Church for Heaton.—We understand that the members of the Presbyterian Church of England, at Heaton, feeling the inconvenience and inadequacy of their present place of worship, have determined upon the erection of a church, with lecture-hall and other buildings, fronting to Tynemouth-road, and have commissioned Mr. J. J. Lish, architect, Newcastle, to proceed at once with the designs, and invite tenders for the carrying out of the works, with the view of having the contract let, and substantial progress made with their new buildings before the winter sets in.

New Theatre Royal, Dublin.—Mr. C. J. Phipps has prepared plans for the new Theatre Royal, intended to be erected in Dublin upon the site of the old theatre, which last February was destroyed by fire. In the new plan the position of the theatre is reversed, the frontage being towards Hawkins's-street, and it is thrown back some 40 ft., so that the proportions of the façade may be better seen, and a greater space allowed for carriages. A carriage-porch, somewhat similar to that at the Italian Opera House, Covent Garden, gives access by five doorways to the outer vestibule on a level with the street, into which also open two other doorways for those coming on foot to the crush-room, 31 ft. by 50 ft. Here are entrances into the corridor of the auditory for visitors to the orchestra-stalls and the pit-stalls on the same level, the grand staircase to the dress-circle or first tiers on the right hand, and that to the upper-circle or second tier to the left hand. The pit proper is entered by an arcade of three doorways in Poolbeg-street, and two flights of stairs lead to the pit corridor immediately above the pit and orchestra-hall corridor. There is a special entrance for the Lord-Lieutenant in Hawkins-street. The dress-circle has six rows of arm-chairs, and behind this are private boxes opening out from the corridors. Every tier of the auditorium has its inclosing corridor. Immediately behind the corridor of the dress-circle is a spacious *foyer*, 31 ft. long by 50 ft., intended to be used as a drawing-room, and for a promenading, refreshment, and smoking room. The dress-circle holds, with private boxes, 400; the upper-circle, 400; the orchestra and pit-stalls, 1,300; and the gallery, 1,300,—making the total number the auditory will hold over 3,400, which is about 500 more than the old theatre could contain. The width of the proscenium opening is 33 ft., and the stage is 72 ft. wide between the walls, by a depth of 65 ft. The style of the exterior elevation is Italian. The architect believes that by the autumn of 1881 the theatre will be ready for opening.

Loans for Public Works.—The fifth annual report of the Public Works Loan Board, 1879-80, has been presented to Parliament. The Loan Commissioners mention that four Acts affecting them were passed during the session of 1879, —two of them being the Artisans' and Labourers' Dwellings Act (1868) Amendment Act, and the Public Works Loans Act. The Commissioners remark on the number of harbour loans that are in arrear. They say . . the Acts of Parliamet passed to enable harb. . to be made practically bind them to entert. . . application for a loan where the estimate of the cost is shown to be trustworthy and the revenue appears sufficient. They are strongly of opinion that, with a view to prevent loss to the Exchequer, it would be expedient that when Parliamentary powers of borrowing are conferred for the execution of harbour works, further authority should be given for levying and assigning rates on property as collateral security for the repayment of the money to be advanced. They maintain that this course is perfectly equitable, as the property in the district, the inhabitants of which are the promoters of the harbour scheme, will be primarily benefited by the execution of the harbour works. A similar course has been adopted in the case of railways and of one or two municipal corporations, who are also the harbour authority. In Appendix F appear the particulars of the loans granted in the past year. In all, 3,381,621*l.* was advanced in 1879-80 by the commissioners, as compared with 3,471,358*l.* in 1878-9. Of this sum of 3,381,621*l.*, 980,776*l.* was advanced under the Elementary Education Acts, 1,637,819*l.* as sanitary loans, 111,546*l.* under the Artisans' and Labourers' Dwellings (Scotland) Improvement Act, 1875. Notice has to be given beforehand of the amounts intended to be applied for, and the notices greatly exceed the sums actually advanced. The notices given in 1879-80 were for 11,300,180*l.*; the notices given for 1880-1 are 8,735,663*l.*

The "Inner Circle" Railway Completion Bill was before the House of Commons on Tuesday last, when it was opposed by Mr. Alderman Lawrence and others, chiefly on account of the powers sought for "under-pinning" and "burrowing" under houses without compensation, which, it was contended, constituted a breach of the Lands Clauses Consolidation Act, and a new departure in Private Bill legislation. The Bill was discussed at some length, and in the end it was thrown out by 150 to 133.

How Wood is affected by Imperfect Application of Creosote.—Some misapprehension concerning the properties of creosote as a preservative of wood appears to exist which it is very desirable should be removed. The *Timber Trades Journal* says, "Vegetable matter decomposes rapidly when under the pressence of heat, and when the vapours which result from the fermentation consequent cannot escape. To give to wood an external application of creosote is to close the pores of the wood, and so to prevent the vapours which arise as soon as fermentation commences from passing away. Under such conditions fermentation rapidly increases, and, as a matter of course, decay quickly follows, and, when it has once commenced, its progression is very rapid. When wood is properly treated so as to receive creosote, the air is exhausted from the sap vessels, and the creosote oil being thus enabled to pass completely through the pores, or channels, the wood can, by the aid of a powerful pump, be thoroughly saturated with the oil, and the antiseptic qualities of creosote would then effectually prevent decay in any form. If an external application of creosote were not positively injurious to the wood,—which we, however, maintain it is,—the oil is so vaporizable that a mere coating would in a few weeks, being so completely exposed to the action of the atmosphere, evaporate to such an extent that any beneficial action which it is possible it might have once possessed would have departed, and then the cost of the operation would be thrown away entirely. The evaporation would in a few weeks be so complete that we doubt very much if the presence of creosote could be even detected by the smell." Creosote has long been a useful ally to engineers, and it is important that its properties should be thoroughly understood. Properly applied to wood, its antiseptic properties effectually arrest decay, but its indiscriminate use is a great evil; for, as above pointed out, it will, if improperly, or rather imperfectly, applied, assist decay, and thus its employment is discouraged, and a real benefit is passed over.

Statistics of Glasgow.—Mr. William West Watson, F.S.S., City Chamberlain of Glasgow, in his annual report (lately issued) on the vital, social, and economic statistics of the city for the past year says,—The rainfall, which amounted to over 37 in., could not be called inordinate, but there was a ceaseless drizzle which extended over 204 days, and a low temperature. The births numbered 19,674, 10,018 boys, and 9,666 girls, a decrease of 920; and the deaths, 12,493, 6,244 of males and 6,249 of females, a decrease of 1,647; so that the natural increase of the population was 7,191, an increase of 725 for the period indicated. The marriages numbered 4,180, the lowest total recorded during the year since registration was instituted, and about 600 below the average. The population at the middle of the year Mr. Watson estimates at 578,156, or, including those resident in the suburbs, at 760,891, and he says that thus, beyond doubt or question, Glasgow stands the second city in the United Kingdom. The property consisted of 106,889 dwelling-houses, of which 12,216 were unoccupied; and other buildings to the number of 20,212, of which 4,684 were unoccupied. The rental amounted to 3,406,000*l*., being an increase of 10,356*l*. on that for the previous year. Emigrants, principally Scotch, to the number of 20,535, of whom more than one half were unmarried adults, sailed from the river, mostly for the United States. The quantity of water sent into the city averaged 37,636,265 gallons a day, and the quantity of gas manufactured reached 1,833,678,000 cubic feet.

Wages in the Leeds Building Trades. The operative masons, bricklayers, and labourers of Leeds have to submit to a reduction of wages. On the 27th of January, the masons and bricklayers, who had been receiving 8½d. per hour, were given six months' notice of a reduction of 1d. per hour. Deputations representing masters and men have agreed, however, to a reduction of ½d. per hour, all other rules to remain unaltered. The labourers, whose rate of payment was 5½d. per hour, received notice of a reduction to 5d., and this will take place on and after the 1st of August.

The Bristol Wagon Works Company, Limited, the well-known makers of carts, wagons, &c., have recently changed the address of their London office, and appointed Mr. R. Hill, of 8, Victoria-chambers, Westminster (formerly of their works at Bristol), as their London representative in this department.

St. John Lateran, Rome.—The question of enlarging the tribune of the Basilica of St. John Lateran has, according to a *Times* correspondent, been decided in favour of continuing the works. They were commenced in 1876 by order of Pius IX., it being considered that the space the tribune afforded was insufficient for the celebration of the religious ceremonies with that decorum required in the cathedral church of Rome, *mater et caput* of all others. The works were, however, suspended on account of the alarm raised by archæologists, artists, and historians at the contemplated demolition of the ancient apse, and the great possibility of the important mosaics within it being irreparably injured, if not destroyed, in process of taking them down from their original position and replacing them in the new apse to be constructed. On Leo XIII. ascending the Pontifical throne he ordered an examination to be made into the archæological and liturgical exigencies of the case, and the possibilities of reconciling them. The investigations were carried on under the supervision of a member of the Sacred College, "of great authority in archæology," who ultimately set forth their results in a general report. The first step taken was the nomination of a Commission composed of the distinguished archæologists Baron P. E. Visconti, the Commendatore G. B. de Rossi, and the Rev. Padre Bruzza, to report upon the antiquity of the apse and the mosaics within it, and their decision has been contrary to the opinions expressed by some, that the apse and a portion of the mosaics belong to the time of Constantine. The pamphlet points out that the construction of the apse is not of that period; that no such stamps bearing the initials of Constantine have been found on the bricks as were discovered in numbers when the apse of old St. Peter's was demolished; that the original apse was reconstructed by Sergius II. in 845, when he was compelled by the canon law to enlarge the cathedral church, and that his apse, after having been repaired by Sergius III. in the tenth century, was in so ruinous a condition at the end of the thirteenth that it was rebuilt from the foundations by Nicholas IV.

Compensation Case.—At the Sheriffs' Court, Red Lion-square, on Wednesday, the case of Mein *v.* The Metropolitan Board of Works came before Mr. Under-Sheriff Burchell and a special jury. This was an appeal from an award made by Sir H. Hunt, under the Artisans' Dwellings Act, for premises erected in Foster-buildings, Whitecross-street, by Mr. Mein, a tailor in Fore-street, for his workmen. Being dissatisfied with the amount awarded, Mr. Mein appealed, but the jury were not allowed to know the sums mentioned in the award. Witnesses were examined on both sides, and the case occupied the Court till half-past six o'clock. About 2,900*l*. had been laid out on the premises, and it was said that after notice of a new scheme Mr. Mein continued the building. Mr. Under-Sheriff Burchell left the case to the jury, either to assess the compensation on the money expended, or on the rental value, which exceeded 3,000*l*. The jury assessed the compensation at 2,750*l*. It was stated that the award made by Sir H. Hunt was 2,900*l*., and the verdict being under that amount, the claimant will have to pay costs of both sides.—*Metropolitan.*

Pneumatic Bells.—Considerable improvements in pneumatic signalling apparatus are effected by Mr. A. Clarke's patent. The airholders as now used are made wholly of indiarubber, and of a hemispherical or oval form, being entirely closed with the exception of a small hole generally fitted with a short tubular neck for connexion to the air-tube leading to the bell or indicator. These holders usually contain a spring to expand them after they had been compressed, and are found to be subject to several disadvantages. Mr. Clarke's invention obviates these by making the air-holder of a cup form, *i.e.*, entirely open on the flat side, so that it can be readily cleaned out before being fixed for use, and of such a shape and thickness that it will not collapse with usage. It also dispenses with the spring inside the airholder, except for long distances when a pull-handle is used; a spring is applied inside the airholder, but does not touch it in any part. Should the airholder at any time require to be removed it can be without injury to the wall or paper. The invention also comprises improvements whereby the valves obliged to be used to prevent the return of the air in long tubes are dispensed with.

The Sanitary Condition of City Establishments.—The attention of the City Commissioners of Sewers has recently been directed to the sanitary, or rather the insanitary, conditions of the residential portions of some of the large City establishments in the drapery and other trades. In the particular case which came before the meeting, a large number of young men and women seem to have been stowed away at night in small, low-ceilinged, and badly-ventilated rooms contiguous to dilapidated and badly-constructed water-closets. Under such conditions it is not to be wondered at that disease broke out. Dr. Sedgwick Saunders, the medical officer of health, hopes that the facts elicited and published in the report of the sanitary inspector may have some effect in directing the attention of the heads of large warehouses to the necessity for some kind of supervision over the residential portion of their establishments.

Art Exhibitions for Glasgow.—The Glasgow Institute of Fine Arts have arranged to hold a loan exhibition of works by the late Sam Bough, R.S.A., and the late G. P. Chalmers, R.S.A., and an exhibition of works in black and white, the first that has been held in Scotland, simultaneously, in the months of August and September.

TENDERS

For Board schools for girls and infants, for the Bushey School Board, Herts. Mr. H. H. Bridgman, architect. Quantities supplied by Mr. Frederick Thomson:—

Larter	£2,848 0 0
Scrivener & Co.	2,798 0 0
Andrews & Son	2,797 0 0
Toms	2,769 0 0
Chadwick	2,648 0 0
Wall	2,630 0 0
Hunt	2,600 0 0
G. & J. Waterman (accepted)	2,388 0 0

For alterations and additions to Nos. 332 and 334, Mile End-road, for Mr. J. Bishop. Mr. Geo. Ashby Lean, architect:—

Holbord	£993 0 0
Judd	949 0 0
Field	931 0 0
Parrish (accepted)	840 0 0

For works at Elm View, Hendon, for Mr. Alfred Smart. Mr. William Theobalds, architect:—

Willett, Hendon, (accepted).

For completing 27, Store-street, Bedford-square, for Mr. C. Rigby. Mr. A. Jowers, architect. Quantities supplied by Mr. H. Lovegrove:—

Stimpson & Co.	£618 0 0
Langmead & Way	617 0 0
Longmire & Burge	598 0 0
Patman & Fotheringham	593 0 0
Halliday	565 0 0
Blandford & Co.	559 0 0
Grover	548 0 0
Williams	500 0 0
Steep	475 0 0
Bishop & Hooper (accepted)	459 0 0

For repairs and ventilation to the Clayton Memorial Schools, York-street, Walworth. Mr. Ellis Marsland, architect:—

Marsland, Walworth	£320 0 0
Gilbert, Camberwell	265 0 0
Morby, Fleet-street (accepted)	248 0 0
Tyerman, Walworth	242 0 0

For alterations and additions to residence, Champion Park, Denmark-hill. Messrs. Adams Murphy & Putley, architects. Quantities not supplied:—

Andrews & Anson	£1,695 0 0
Hayward & Sons	1,500 0 0
McLachlan & Sons	1,471 0 0
Colls & Sons	1,445 0 0
Maxwell Bros.	1,388 0 0

For the erection of a pair of semi-detached residences, at Deptford Lower-road, for Mr. Edward Sheppard. Mr. W. T. Hunt, jun., architect:—

Redman	£1,237 0 0
Redman	1,175 0 0
Newman	1,080 0 0
A. & F. Smith (accepted)	1,045 0 0

For alterations and additions to the Hercules Pillars public-house, Greek-street, Soho, for Mr. Higgins. Mr. W. J. Worthington, architect. Quantities supplied:—

Earle & Son	£750 0 0
Grimwood & Sons	679 0 0
Phillips	637 0 0
Pickersgill	612 0 0
Lamble	563 0 0
J. & H. Cox	543 18 0

For building a "Bon Marché," at Kilburn, for Mr. Cossey. Mr. H. E. Williams, architect. Quantities supplied:—

Lamble	£3,278 0 0
Barnes	2,909 0 0
Denton	2,950 0 0
Marr	2,878 0 0
Patman & Fotheringham	2,685 0 0
Aitchison & Walker	2,475 0 0

For alterations to 103, Tottenham-court-road, for Mr. W. Mackness. Mr. George Edwards, architect:—

Richardson	£435 0 0
Stimpson & Co.	279 0 0
White	273 0 0

For alterations and additions to house at Leatherhead, for Mr. H. Courage. Mr. W. G. Bartlett, architect:—

Brown	£550 0 0
Batchelar	535 0 0
Walker (accepted)	534 0 0

For the erection of four cottages and shop at Leatherhead, for Mr. James Attlee. Messrs. Bargman & Benison, architects:—

Hemblin Bros.	£1,470 0 0
Brown	1,427 0 0
Walker	1,394 0 0
Jarvis (accepted)	1,285 0 0

For curator's house and fencing, for the St. Neot's Burial Board. Mr. W. Jackson, architect. Quantities not supplied:—

Lord (too late)	£633 0 0
Osborne	597 0 0
Wellham & Weycroft	569 0 0
Wade & Edey (accepted)	529 10 0

For alterations and additions to No. 13, Victoria-road, Kensington, for Mr. G. S. Symons. (Second contract.) Mr. W. H. Collbran, architect:—

W. Farthing & Co.	£410 0 0

For enlarging dining-saloon and building servery (exclusive of decorations), for Major-General C. Baring, Belgravia. Mr. W. H. Collbran, architect:—

Hart	£216 0 0

For additions to premises, Curtain-road, for Messrs. Parker Bros. Mr. J. Hamilton, architect. Quantities by Mr. A. Johnson:—

Crabb (accepted)	£2,058 0 0

For pulling down and rebuilding 23, Vanstone-place, Fulham, for Mr. James Compton. Mr. William Cowdry, architect:—

Barnes	£499 10 0
Lathey Bros.	453 0 0
Davis	432 10 0
Parkinson, Fulham (accepted)	393 0 0

For preparation of site for chapel, Loampit-vale, Lewisham. Mr. J. Cubitt, architect:—

Staines & Son	£287 0 0
Jerrard	270 0 0

For alterations and repairs at the North Pole, Shadwell. Messrs. Perry & Reed, architects:—

		Time.
Clarke & Bracey	£1,336 0 0	12 weeks.
Mills	1,171 0 0	—
Mark	896 0 0	12 weeks.
Staines & Son	896 0 0	9 ,,

For new south aisle at Christchurch, Finchley. Mr. J. Norton, architect. Quantities by Mr. Thacker:—

Grover	£2,053 0 0
Braid & Co.	2,024 0 0
Adamson & Son	1,986 0 0
Staines & Son	1,889 0 0
Lawrence	1,798 0 0
Plowman	1,735 0 0
Boyce	1,719 0 0

For Methodist Free Church new schools and chapel improvements, Forest-gate. Mr. F. Boreham, architect. Quantities by Messrs. Mann & Saunders:—

	Schools.	Chapel Works.
Horlock (in error)	£2,257 0 0	£ 900 0 0
Alexander	2,232 19 0	1,343 0 0
Sargeant	2,197 0 0	1,345 0 0
Godbold	2,110 0 0	1,283 0 0
Bangs	2,020 0 0	1,240 0 0
Morter	1,968 0 0	1,189 0 0

For the erection of a block of school buildings and appurtenances (to accommodate 946 children), at Grange-road, Plaistow, Essex, for the West Ham School Board. Mr. J. T. Newman, architect. Quantities supplied by Messrs. Curtis & Sons:—

Catley	£8,390 0 0
Abrahams	7,697 0 0
North Bros.	7,650 0 0
Hoskings	7,549 0 0
Hearle & Son	7,445 0 0
Boyce	7,443 0 0
Wall Bros.	7,429 0 0
Nightingale	7,234 0 0
Knight & Dustow	7,117 0 0
F. & F. J. Wood	7,087 0 0
Reed	6,996 0 0
Morter	6,813 0 0
Gentry (accepted)	6,495 0 0

For the erection of three cottages, at Fetcham, Leatherhead, for Mr. J. Barnard Hankey. Mr. F. J. Dibble, architect:—

Batche'ar	£953 15 0
Edser	885 0 0
Heselgrave	847 10 0
Hamblin Bros.	816 0 0
Brown	800 0 0
Walker (accepted)	798 0 0

TO CORRESPONDENTS.

SS. Mary and John's (E.C.) Church, Wolverhampton.—The works here described in our issue of the 10th inst.) were carried out by Messrs. Dawson & Bradney (now Bradney & Co.), builders, Wolverhampton.

J. T.—W.—G. A. L.—W. H. C.—C. H.—S. & Son.—E. K.—W. C.—Mr. L.—J. C. R.—W. T. H.—J. J. L.—D. W.—F. B.—R. H. C.—Messrs. B.—J. H.—E. H.—D. A. O.—J. H.—P, Bros. (should send list of tenderers and amounts).—S. P. (we must decline to express any opinion as to whether the Vicar told a story or not!)—P. & Son (next week).

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course with the authors.

NOTICE TO SUBSCRIBERS.

THE INDEX and TITLE-PAGE for Volume xxxviii. (January to June, 1880) was given as a Supplement with our Number for July 10.

A COLOURED TITLE-PAGE may be had, gratis, on personal application at the Office.

CLOTH-CASES for binding the Numbers are now ready, price 2s. 6d. each; also

READING-CASES (Cloth), with Strings, to hold a Month's Numbers, price 2s. each.

THE THIRTY-EIGHTH VOLUME of "The Builder" (bound) is now ready, price Twelve Shillings and Sixpence.

SUBSCRIBERS' VOLUMES, on being sent to the Office, will be bound at a cost of 3s. 6d. each.

CHARGES FOR ADVERTISEMENTS.

SITUATIONS VACANT, PARTNERSHIPS, APPRENTICESHIPS TRADE, AND GENERAL ADVERTISEMENTS.

Six lines (about fifty words) or under ..... 4s. 6d.
Each additional line (about ten words) ..... 0s. 6d.

Terms for series of Trade Advertisements, also for Special Advertisements on front page, Competitions, Contracts, Sales by Auction &c. may be obtained on application to the Publisher.

SITUATIONS WANTED.

FOUR Lines (about THIRTY words) or under ..... 2s. 6d.
Each additional line (about ten words) ..... 0s. 6d.

REPLIES TO ADVERTISEMENTS,

Addressed Box ——, Office of "The Builder,"

Cannot be forwarded, but must in all cases be called *for*, and the Office Receipt produced

THE CHARGE FOR A BOX IS AS UNDER:—

For "Situations Wanted" Advertisements ..... 3d. per Week.
For all other Advertisements ..... 6d. per Week.

PREPAYMENT IS ABSOLUTELY NECESSARY.

*** Stamps must not be sent, but all small sums should be remitted by Cash in Registered Letter or by Money Order, payable the Post-office, King-street, Covent-garden, W.C. to

DOUGLAS FOURDRINIER, Publisher,
Addressed to No. 46, Catherine-street, W.C.

Advertisements for the current week's issue must reach the office before THREE o'clock p.m. on THURSDAY.

The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, &c. left at the Office in reply to Advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

TERMS OF SUBSCRIPTION.

"THE BUILDER" is supplied direct from the Office to residents in any part of the United Kingdom at the rate of 28s. per annum prepaid. Remittances payable as above.

Helliwell's Patent New System of Imperishable Glazing without Putty, suitable for Markets, Railway Stations, and all kinds of covered and Horticultural Buildings. All woodwork is covered, and no outside painting is required, old roofs reglazed. Testimonial to T. W. Helliwell:—"I cannot see what better Testimonial you can require from me than the fact that I have taken off all my glass and removed other work to replace it with yours. There is nothing yet out can touch it.—W. R. PRESTON, Harrold Wood."—T. W. HELLIWELL, Brighouse, Yorkshire, and 19, Parliament-st., London. [ADVT.]

Bath Stone of Best Quality.
RANDELL, SAUNDERS, & CO. (Limited),
Quarrymen and Stone Merchants.
List of Prices at the Quarries and Depôts; also cost of transit to any part of the Kingdom, on application to
Bath Stone Office, Corsham, Wilts. [Advt.]

Doulting Freestone and Ham Hill Stone of best quality.
Prices, delivered at any part of the United Kingdom, given on application to
CHARLES TRASK,
Norton-sub-Hamdon, Ilminster, Somerset. [ADVT.

Bath Stone.
WINSLEY GROUND and
FARLEIGH DOWN
Supplied in any Quantities on the Shortest Notice.
PICTOR & SONS, Box, Wilts.—[ADVT.]

Asphalte.
Seyssel, Patent Metallic Lava, and White Asphaltes.
M. STODART & CO.
Office:
No. 90, Cannon-street, E.C. [ADVT.]

Asphalte.—The Seyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 28, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds and milk-rooms, granaries, tun-rooms, and terraces. [ADVT.]

Whitland Abbey Green Slates.—The peculiar green tint of these stout, durable Slates recommends them for Churches, Mansions, and Public Buildings. Present Orders booked at Reduced Prices.—Apply to Mr. J. MUSCOTT, Clynderwen, R.S.O., South Wales.—[ADVT.]

J. Sessions & Sons, Docks, Gloucester, Manufacturers of ENAMELLED SLATE and MARBLE CHIMNEY-PIECES, URINALS, &c. WELSH ROOFING SLATES direct from Quarries to any Station in the Kingdom. Manufacturers of Joinery & Mouldings. [ADVT.]

Immense quantities of good Dry Spanish and Honduras Mahogany, Riga and American Wainscot, Quebec and Italian Walnut, Veneers of all kinds, and all descriptions of Fancy and other Woods specially adapted for Cabinet and Joinery purposes, ON SALE, Wholesale and Retail, at
B. J. HUDSON & SONS',
Whitfield-street, W., and Great Peter-street, S.W.—[ADVT.]

MICHELMORE & REAP,
Manufacturers of
CHARLES COLLINGE'S PATENT
COLLINGE'S PATENT HINGES,
LEVER, SCREW, & BARREL BOLTS,
Self-Acting "FALL DOWN" GATE STOPS,
and IMPROVED GATE FITTINGS of every Description.
36A, BOROUGH ROAD,
Discount to Builders. Illustrated List two stamps. LONDON, S.E.

EASTWOOD & CO., Limited,

Wellington Wharf, Belvedere-road, London.
Ludgate Wharf, Upper Thames-street.
Canal Bridge Wharves, Old Kent-road.
Lotts-road, Chelsea.

SOLE CONSIGNEES OF THE ELTRINGHAM COLLIERY CO.'S

GLAZED BRICKS, BOTH WHITE AND COLOURED,

NEWCASTLE FIRE BRICKS, LUMPS, TILES, AND CLAY,
SUPERIOR GLAZED STONEWARE DRAIN PIPES, &c.

Supplies of these Goods are kept at their various Wharfs as above, and can be supplied at low prices.

SPECIAL ATTENTION GIVEN TO ARCHITECTS' DESIGNS.

FOR PRICES, &c., APPLY AT 47, BELVEDERE ROAD, LAMBETH, S.E.